ACOUSTICAL ANALYSIS REPORT

Shellstrom Condominiums
Lakeshore Drive and Channel Road
Lakeside, County of San Diego, California 91935

County of San Diego Log No. 04-14-025
Tentative Parcel Map # 20850

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1.0 EXECUTIVE SUMMARY

The proposed project consists of the construction of a single two-story, multi-family condominium building containing 4 units. There are proposed common outdoor use areas, which are planned to be located at the north and west of the proposed building. The project site is located near the intersection of Lakeshore Drive and Channel Road, on the northern side of Lakeshore Drive, near Laurel Street, in the unincorporated area of Lakeside, County of San Diego, California.

The primary noise source in the vicinity of the project site includes automobile and truck traffic noise from State Route (SR) 67 and Lakeshore Drive. No other noise source is considered significant. The current calculated on-site traffic noise level at the southern property line of the project site is 64.6 Community Noise Equivalent Level (CNEL). Due to a projection of no change in traffic volume of Lakeshore Drive, the future (year 2030) traffic noise level at the southern property line of the project site is expected to remain at 64.6 CNEL. However, due to an increase in traffic volume of SR-67, noise levels on the northern half of the property are expected to increase to 64.8 CNEL.

Without mitigation, future traffic noise levels at the proposed outdoor use areas are expected to range from approximately 48.8 CNEL at the second story southeastern balcony to 66.1 CNEL at the northern common outdoor use space. Mitigation to provide an exterior noise level below 60 CNEL will be necessary and can be achieve by increasing the height of the existing wood fence along the northern property line to 12-feet and increasing the height of the existing wood fence along the western property line to 9-feet. The improved wood fence height must also meet the construction criteria defined in Section 5.0 for a Sound Attenuation Barrier. Due to the close proximity of existing large buildings and the topography of the surrounding roadways, on-site noise levels are sporadically high and low throughout the proposed site. Due to the discontinuous nature of these noise levels, noise level contours are difficult to express graphically and may not be entirely linear, as depicted.

Calculations show that future mitigated traffic noise levels at the building facades will range from 57.9 CNEL at the first level southern area of the western facade to 71.1 CNEL at the second level northern facade. Since future exterior on-site noise levels will exceed 60 CNEL at many of the building facades, an exterior-to-interior noise analysis was conducted to evaluate the sound reduction properties of proposed exterior wall, window and sliding glass door construction designs. Due to the elevated exterior noise levels, future interior noise levels in all of the habitable rooms may exceed the 45 CNEL interior noise limit for habitable residential space, with windows in an open position.

Mechanical ventilation, which allows windows to be closed for an extended length of time, is a necessary element to achieve future interior noise levels below 45 CNEL in habitable residential space, in compliance with the County of San Diego and the State of California Building Code requirements. For further details on exterior-to-interior calculation and results please refer to Section 5.0 of this report.

Calculations show that with the proposed 9-foot high sound attenuation barrier along the western property line and the noise impacts from the four ground mounted air conditioning units located along the western building facade will be as high as 51.9 dBA L_{EQ} at a third level receptor on the western property line. The impacts were also evaluated at a location 10-feet beyond the adjacent property line to evaluate the impacts to the existing neighboring residential building where calculations show that the propagate noise impacts at this location will be as high as 43.9 dBA L_{EQ} at the third level.

The project-related construction schedule is expected to include one piece of light-grading equipment which will have negligible noise impact to neighboring residences. The average 8-hour equivalent noise level will not exceed the 75 dBA noise limit at the western, northern, and eastern property lines. Therefore, no temporary construction noise mitigation is required due to projected light duty and short duration grading operations at the project site.

2.0 INTRODUCTION

This acoustical analysis report is submitted to satisfy the acoustical requirements of the County of San Diego for a Site Development/Tentative Parcel Map permit approval. Its purpose is to assess noise impacts from nearby roadway traffic and to identify project features or requirements necessary to achieve exterior noise levels of 60 CNEL or less in outdoor use areas and interior noise levels of 45 CNEL or less in habitable residential space ,in compliance with the County of San Diego and State of California noise regulations. Temporary construction noise impact issues will also be addressed due to projected grading operations on the project site.

All noise level or sound level values presented herein are expressed in terms of decibels, with A-weighting to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ}, for a specified duration. The CNEL is a 24-hour average, where sound levels during evening hours of 7:00 p.m. to 10:00 p.m. have an added 5 dB weighting, and sound levels during nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dB weighting. This is similar to the Day-Night sound level, L_{DN}, which is a 24-hour average with an added 10 dB weighting on the same nighttime hours but no added weighting on the evening hours. Sound levels expressed in CNEL are always based on A-weighted decibels. These metrics are used to express noise levels for both measurement and municipal regulations, for land use guidelines, and for enforcement of noise ordinances. Further explanation can be provided upon request.

2.1 Project Location

The project site is located near the intersection of Lakeshore Drive and Channel Road, on the northern side of Lakeshore Drive, near Laurel Street, in the unincorporated area of Lakeside, County of San Diego, California. The Assessor's parcel number (APN) for the property is 394-022-07. The overall property is rectangular in shape with an overall site area of approximately 7,500 square feet.

The project site is currently zoned for residential (RU-29) use. Neighboring land uses in the proximity of the proposed project are residential to the south and the west, with some commercial activities to the northwest and to the east.

According to the County of San Diego:

"The project site as well as adjacent land uses are zoned RU29 Urban Residential that allows a one-hour average sound level of 55 decibels (dBA) from 7a.m. to 10p.m. and 50 decibels (dBA) from 10p.m. to 7a.m."

The project location is shown on the Vicinity Map, Figure 1, following this report. An Assessor's Parcel Map, Satellite Aerial Photograph, Topographic Map, and Planned Land Use Map of this area are also provided as Figures 2 through 5.

2.2 Project Description

The proposed project consists of the construction of a single two-story, multi-family condominium building containing 4 units. There are proposed common outdoor use areas, which are planned to be located at the north and west of the proposed building.

3.0 ENVIRONMENTAL SETTING

3.1 Existing Noise Environment

The primary noise source in the vicinity of the project site include automobile and truck traffic noise from SR-67 and Lakeshore Drive. No other noise source is considered significant.

SR-67 is a six-lane, two-way, major highway running north-south in the vicinity of the project site. The paved roadway width is approximately 140 feet, with shoulders on each side and a grass median that is 40 feet in width. The posted speed limit is 65 mph. SR-67, in the vicinity of the project site, currently carries a combined (north and south) traffic volume of approximately 43,000 Average Daily Trips (ADT), according to the San Diego Association of Governments Department of Transportation Website (http://www.sandag.org).

Lakeshore Drive is a two-lane, two-way non-circulation, residential collector running east-west in the vicinity of the project site, according to Richard Chin, County of San Diego Traffic Engineer, 858-874-4203. The paved roadway width is approximately 45 feet. The current posted speed limit is 25 mph. A future speed limit of 30 mph, which is the minimum design speed according to the County of San Diego Public Road Standards, was used to model worst-case traffic noise impacts. Lakeshore Drive, in the vicinity of the project site, currently carries a combined traffic volume of approximately 6,000 Average Daily Trips (ADT), according to the San Diego Association of Governments Department of Transportation Website (http://www.sandag.org).

The current calculated on-site traffic noise level at the southern property line of the project site is 62.6 CNEL. Current and future traffic volumes for the roadway sections near the project site are shown in Table 1: Overall Roadway Traffic Information. For further roadway details and projected future ADT traffic volumes, please refer to Appendix A: Sound32 Data and Results.

Table 1. Overall Roadway Traffic Information

Roadway Name	Speed Limit (mph)		Current ADT	Future (2020) ADT
	Current	Future		
Lakeshore Drive	25	30	6,000	6,000
SR-67 South	65	65	22,000	32,000
SR-67 North	65	65	21,000	37,000

Current and future truck percentages were provided by Larry Horsman, San Diego County Traffic Engineer. Please Refer to Appendix A: Sound 32 Data and Results for additional traffic data information.

3.1.1 Measured Noise Level

An on-site inspection and traffic noise measurement was made in the afternoon of Friday, November 5, 2005. The weather conditions were as follows: clear skies, low humidity, temperatures in the high 70's with winds from the west at 3-4 mph. A “one-hour" equivalent measurement was made at the southern property line, facing Lakeshore Drive. The microphone position was placed approximately five feet above the existing project site grade. Traffic volumes were recorded for automobiles, medium-size trucks, and large trucks during the measurement period. After a continuous 15-minute sound level measurement, there was no change in the L_{EQ} and results were then recorded. The measured noise

level and related weather conditions are found in Table 2: On-Site Noise Measurement Conditions and Results. The calculated equivalent hourly vehicle traffic count adjustment and a complete tabular listing of all traffic data recorded during the on-site traffic noise measurement are found in Appendix A: Sound32 Data and Results.

Table 2. On-Site Noise Measurement Conditions and Results	
Date	Friday, November 5, 2005
Time	2:45 p.m. - 3:00 p.m.
Conditions	Clear Skies, Winds from the West @ 3-4 mph, Temperature High 70's with Low Humidity
Measured Noise Level	62.5 dBA L_{EQ}

3.1.2 Calculated Noise Level

Noise levels were calculated for the site using the methodology described in Section 4.1 (see next page) for the location, conditions, and traffic volumes counted during the noise measurements. The calculated noise levels (L_{EQ}) were compared with the measured on-site noise level to determine if adjustments or corrections (calibration) should be applied to the traffic noise prediction model, Sound32. Adjustments are intended to account for site-specific differences, such as reflection and absorption, which may be greater or lesser than accounted for in the model.

The measured noise level of 62.5 dBA L_{EQ} for Lakeshore Drive and SR-67 was compared to the calculated (modeled) noise level of 62.6 dBA L_{EQ}, for the same conditions and traffic flow. As there was only a 0.1 dBA difference between the measured and the calculated noise level, no adjustment was deemed necessary to model future noise levels for this location. Please refer to Table 3: Calculated versus Measured Traffic Noise Data, for further evaluation.

Table 3. Calculated versus Measured Traffic Noise Data				
Roadways	**Calculated**	**Measured**	**Difference**	**Correction**
Lakeshore Dr. and SR-67	62.6 dBA L_{EQ}	62.5 dBA L_{EQ}	0.1 dBA L_{EQ}	none

3.2 Future Noise Environment

The future (year 2030) traffic volumes for Lakeshore Drive and SR-67 were obtained from the San Diego Association of Governments Department of Transportation Website (http://www.sandag.org). The future (year 2030) traffic volume for Lakeshore Drive is projected to be 6,000 ADT, which indicates that Lakeshore Drive is considered to be at buildout. The future (year 2030) combined (north and south) traffic volume for SR-67 is projected to be 69,000 ADT. The future (year 2030) traffic noise level at the southern property line of the project site, without mitigation, is expected to remain at approximately 64.4 CNEL. However, due to an increase in traffic volume of SR-67, noise levels on the northern half of the property are expected to increase to 64.8 CNEL. Please refer to Figure 6: Site Plan Showing Future Traffic CNEL Contours and Noise Measurement Location.

The same truck percentages from the existing traffic conditions were used for future traffic modeling. The roadway classification, speed limit, alignment and roadbed grade elevations are expected to remain the same for this section of Lakeshore Drive and SR-67. For further roadway details and projected future ADT traffic volumes, please refer to Appendix A: Sound32 Data and Results.

4.0 METHODOLOGY AND EQUIPMENT

4.1 Methodology

4.1.1 Field Measurement

Typically, a “one-hour” equivalent sound level measurement (L_{EQ}, A-Weighted) is recorded for at least one noise-sensitive location on the site. During the on-site noise measurement, start and end times are recorded, vehicle counts are made for cars, medium trucks (double-tires/two axles), and heavy trucks (three or more axles) for the corresponding road segment(s). Supplemental sound measurements of one hour or less in duration are often made to further describe the noise environment of the site.

For measurements of less than one hour in duration, the measurement time is long enough for a representative traffic volume to occur and the noise level (L_{EQ})to stabilize; 15 minutes is usually sufficient for this purpose. The vehicle counts are then converted to one-hour equivalent volumes by using the appropriate multiplier.

Other field data gathered includes measuring or estimating distances, angles-of-view, slopes, elevations, roadway grades, and vehicle speeds. This data was checked against the available maps and records.

4.1.2 Roadway Noise Calculation

The Sound32 Release 1.41 program released by the California Department of Transportation, Division of New Technology, Materials and Research was used to calculate the future daytime average hourly noise level (HNL) at various locations at the project site. The daytime average hourly traffic volume is calculated as 0.058 times the ADT, based on the studies made by Wyle Laboratories (see reference). The HNL is equivalent to the L_{EQ}, and both are converted to the CNEL by adding 2.0 decibels, as shown in the Wyle Study. Future CNEL is calculated for desired receptor locations using future road alignment, elevations, lane configurations, projected traffic volumes, estimated truck mixes, and vehicle speeds. Noise attenuation methods may be analyzed, tested, and planned with Sound32, as required. Further explanation can be supplied on request.

4.1.3 Exterior-to-Interior Noise Calculation

The State Building Code, local municipalities, and other agencies (such as HUD) require an acoustical analysis for any multi-unit residential facility proposed in an area that has or will have exterior noise levels in excess of 60 CNEL. This analysis must demonstrate building features and mitigation that will provide interior noise levels of 45 CNEL or less for residential units, classrooms, or other habitable interior areas and 50 CNEL or less in office space. CNEL is considered synonymous with L_{DN}.

Analysis for the interior noise levels requires consideration of:

- Number of unique assemblies in the wall (doors, window/wall mount air conditioners, sliding glass doors, and windows)
- Size, number of units, and sound transmission data for each assembly type
- Length of sound impacted wall(s)
- Depth of sound impacted room
- Height of exterior wall of sound impacted room
- Exterior noise level at wall assembly or assemblies of sound impacted room

Modeling of exterior wall assemblies using building plan wall details is accomplished using INSUL Version 5.1, which is a model-based computer program developed by Marshall Day Acoustics for predicting the sound insulation of walls, floors, ceilings and windows. It is acoustically based on theoretical models that require only minimal material information that can make reasonable estimates of the sound transmission loss (TL) and Sound Transmission Class (STC) for use in sound insulation calculations, such as the design of common party walls and multiple family floor-ceiling assemblies, etc. INSUL can be used to quickly evaluate new materials or systems or investigate the effects of changes to existing designs. It models individual materials using the simple mass law and coincidence frequency approach and can model more complex assembly partitions, as well. It has evolved over several versions into an easy-to-use tool and has refined the theoretical models by continued comparison with laboratory tests to provide acceptable accuracy for a wide range of constructions. INSUL model performance comparisons with laboratory test data show that the model generally predicts the performance of a given assembly within 3 STC points.

The Composite Sound Transmission data is developed for the exterior wall(s) and the calculated noise exposure is converted to octave-band sound pressure levels (SPL) by addition of an octave data curve for typical traffic noise. The reduction in room noise due to absorption is calculated and subtracted from the interior octave noise levels, and the octave noise levels are logarithmically added to produce the overall interior room noise level. When interior noise levels exceed 45 CNEL, the noise reduction achieved by each element is reviewed to determine what changes will achieve the most cost-effective compliance. Windows are usually the first to be reviewed, followed by the doors, and then the walls.

4.1.4 Cadna Noise Modeling Software

Modeling of the outdoor noise environment is accomplished using Cadna Ver. 3.5, which is a model-based computer program developed by DataKustik for predicting noise impacts in a wide variety of conditions. Cadna (Computer Aided Noise Abatement) assists in the calculation, presentation, assessment, and mitigation of noise exposure. It allows for the input of project information such as noise source data, barriers, structures, and topography to create a detailed CAD model and uses the most up-to-date calculation standards to predict outdoor noise impacts.

4.1.5 Summary of Site Specific Features Included in Cadna Model

The proposed project includes the installation four exterior ground-mounted air conditioning units. The air conditioning units are manufactured by Carrier, model number 38TUA-036.

Carrier manufacturer's data lists the overall sound power noise emission level for this particular A/C unit as 74.0 dBA. The Cadna computer modeling program for the Shellstrom Condominium project uses the Carrier 38TUA-036 model and its associated A-weighted sound power levels per octave band presented by the Carrier on their website www.carrier.com, as shown in Appendix D: Manufacturer's Noise Data. The Cadna modeler automatically calculates the overall sound rating which resulted in 72.4 dBA. An independent logarithmic calculation of the same octave band sound power levels also yields an overall value of 72.4 dBA, where the overall noise emission level of 74.0 dBA as presented by Carrier and shown in Attachment D could not be reconstructed. It is our opinion that Carrier has a typo in their data sheet regarding the overall dBA calculation, and have concluded to accept the Cadna modeler's calculation and analysis. Therefore, the corrected overall dBA sound power level and associated octave data from an operational Carrier 38TUA-036 air conditioning unit according to the manufacturer's noise data is presented in Table 4: Carrier 38TUA-036 Manufacturer's Noise Date in Sound Power Levels. This is the A/C noise emission overall and octave band data that is used for evaluating property line mechanical noise impacts. For additional and updated Cadna modeling data, please refer to Appendix E: Cadna Data and Analysis.

Table 4. Carrier 38TUA-036 Manufacturer's Noise Date in Sound Power Levels								
Octave Band Center Frequency (Hz)	125	250	500	1000	2000	4000	8000	dBA
Sound Power Level (dB)	58.0	64.0	67.5	67.0	66.0	64.5	59.0	72.4

Features at the project site that were included in the Cadna noise prediction model are listed in Table 5: Summary of Site Features Included in Cadna Model. These are considered to be the only on-site features that will affect the noise propagation of the proposed noise sources to the adjacent property lines.

Table 5. Summary of Site Features Included in Cadna Model	
Description	Height
Proposed 2-Story Building	25-feet above grade
Existing Wood Fence	6-feet above grade

4.2 Measurement Equipment

Some or all of the following equipment was used at the site to measure existing noise levels:

- Larson Davis Model 820 Integrating Sound Level Meter, Type 1, Serial # 0316
- Larson Davis Model CA200 Calibrator, Serial # 0292
- Hand-bearing magnetic compass, microphone with windscreen, tripods
- Distance measurement wheel, digital camera

The sound level meter was field-calibrated immediately prior to the noise measurement and checked afterward, to ensure accuracy. All sound level measurements conducted and presented in this report, in accordance with the regulations, were made with a sound level meter that conforms to the American National Standards Institute specifications for sound level meters ANSI SI.4-1983 (R2001). All instruments are maintained with National Bureau of Standards traceable calibration, per the manufacturers' standards.

5.0 IMPACTS AND MITIGATION

5.1 Exterior

The future noise environment is primarily the result of vehicle traffic traveling on SR-67 and Lakeshore Drive. Without mitigation or proposed project structures, the future 60 CNEL traffic contour will be located approximately 30 feet north of the Lakeshore Drive centerline. The future 65 CNEL traffic contour will be located approximately 100 feet north of the Lakeshore Drive centerline. However, due to the close proximity of existing large buildings and the topography of the surrounding roadways, on-site noise levels are sporadically higher and lower throughout the proposed site. Due to the sporadic nature of these noise levels, noise level contours are difficult to express graphically and may not be entirely linear, as depicted.

Without mitigation, future traffic noise levels at the proposed outdoor use areas are expected to range from approximately 48.8 CNEL at the second story southeastern balcony to 66.1 CNEL at the northern common outdoor use space. Mitigation to provide an exterior noise level below 60 CNEL will be necessary and can be achieve by increasing the height of the existing wood fence along the northern property line to 12-feet and increasing the height of the existing wood fence along the western property

line to 9-feet. The improved wood fence height must also meet the minimum construction criteria for a Sound Attenuation Barrier, described as follows:

The required sound attenuation barriers may be a single sound wall in design or a combination of a sound wall atop an earthen berm. For the purpose of this analysis, all proposed sound attenuation barrier heights shall be based on the finished proposed pad grade elevation of each lot. A sound wall should be solid and constructed of masonry, wood, plastic, fiberglass, steel, or a combination of those materials, with no cracks or gaps, through or below the wall. Any seams or cracks must be filled or caulked. If wood is used, it can be tongue and groove and must be at least one half-inch thick or have a minimum surface density of at least 3½ pounds per square foot. Where architectural or aesthetic factors allow, glass or clear plastic may be used on the upper portion, if it is desirable to preserve a view. Sheet metal of 18-gauge (minimum) may be used, if it meets the other criteria and is properly supported and stiffened so that it does not rattle or create noise itself from vibration or wind. Any gate(s) proposed to be constructed in the sound wall must be designed with overlapping closures.

The net benefit of the required sound wall mitigation for the common grassy area at the north end of the project site will break the line-of-sight to neighboring properties, reducing noise to the exterior and first-floor interior residential areas, thus, adequately reducing incidental play area noise to the residential properties to the west.

Table 6, Future Traffic CNEL at Outdoor Use Areas, shows future noise levels at outdoor use areas with and without proposed mitigation in place. Please refer to Figure 7: Site Plan Showing Future Traffic CNEL at Outdoor Use Areas with Proposed Mitigation.

Table 6. Future Traffic CNEL at Outdoor Use Areas

Receiver	Receiver Location	Exterior Traffic CNEL (Unmitigated)	Exterior Traffic CNEL (Mitigated)
R-3	Southern Area of Western Common Use Space	59.0	57.6
R-4	Southeastern Second Story Balcony	48.8	48.8
R-5	Northern Common Use Space	66.1	58.3
R-6	Central Area of Western Common Use Space	59.8	57.9
R-8	Northern Area of Western Common Use Space	62.7	59.1

Calculations show that future mitigated traffic noise levels at the building facades will range from 57.9 CNEL at the first level southern area of the western facade to 71.1 CNEL at the second level northern facade. Table 7: Future Exterior Building Facade CNEL With Proposed Mitigation shows all receivers which will be impacted above 60 CNEL in an outdoor use area. Please refer to Figure 8: Site Plan Showing Future Traffic CNEL at Exterior Building Facades With Proposed Mitigation.

Table 7. Future Exterior Building Facade CNEL With Proposed Mitigation

Receiver	Level	Facade Location	Exterior Traffic CNEL (Unmitigated)	Exterior Traffic CNEL (Mitigated)
R-2	1st	Southern Facade	61.4	61.4
R-3	1st	Western Facade - South	59.0	57.6

Table 7. Future Exterior Building Facade CNEL With Proposed Mitigation				
R-5	1st	Northern Facade	66.1	58.3
R-6	1st	Western Facade - Central	59.8	57.9
R-7	1st	Eastern Facade - South	62.0	60.9
R-8	1st	Western Facade - North	62.7	59.1
R-9	1st	Eastern Facade - Central	62.6	60.6
R-10	1st	Eastern Facade - North	64.1	60.0
R-12	2nd	Southern Facade	63.0	63.0
R-13	2nd	Western Facade - South	63.9	63.5
R-14	2nd	Northern Facade	71.1	71.1
R-15	2nd	Western Facade - Central	64.8	64.3
R-16	2nd	Eastern Facade - South	65.8	65.1
R-17	2nd	Western Facade - North	67.8	67.6
R-18	2nd	Eastern Facade - Central	66.9	66.1
R-19	2nd	Eastern Facade - North	68.9	68.5

5.1.2 Exterior Mechanical Noise Generators

Based on the project information available, calculations show that with the proposed 9-foot high sound attenuation barrier, the proposed four air conditioning units located on the western facade of the proposed building will be in compliance with the County of San Diego nighttime property line noise limits at a location 10-feet beyond the western property line. This is primarily due to the noise attenuation provided by property line distance and shielding from the proposed 9-foot high sound attenuation barrier. Calculations show that the noise impacts will be as high as 43.9 dBA L_{EQ} at the 3rd level location 10-feet beyond the western property line, at the worst-case location.

The calculated noise levels from the proposed air conditioning units at each property line at the worst-case locations are summarized in Table 8: Calculated Noise Levels of Four Air Conditioning Units Including Site Features. For a graphical presentation of the overall A/C noise impacts and their associated property line distances, please refer to Figure 9A: Site Plan Showing Property Line Noise Impacts and A/C Unit Locations and to Figure 9B: Site Plan Showing Property Line Distances and A/C Unit Locations. For additional details of the A/C mechanical equipment noise emission calculations, please refer to Appendix E: Cadna Data and Analysis.

Table 8. Calculated Noise Levels of Four Air Conditioning Units Including Site Features				
Receiver	Location	Cadna Model Noise Level without Existing Fence (dBA)	9-Ft Barrier Insertion Loss (dBA)	Cadna Model Noise Level with Existing Fence (dBA)
R-1	Western Property Line - 1st Floor	55.6	18.6	37.0
R-2	Western Property Line - 2nd Floor	54.1	1.1	53.0
R-3	Western Property Line - 3rd Floor	51.9	0.0	51.9
R-4	10-ft Beyond Western Property Line - 1st Floor	49.8	16.1	33.7

Table 8. Calculated Noise Levels of Four Air Conditioning Units Including Site Features				
R-5	10-ft Beyond Western Property Line - 2nd Floor	49.5	11.7	37.8
R-6	10-ft Beyond Western Property Line - 3rd Floor	48.7	4.8	43.9

5.2 Interior

The State of California requires buildings to be designed in order to attenuate, control, and maintain interior noise levels to below 45 CNEL in habitable multi-family residential space. Current exterior building construction is generally expected to achieve at least 15 decibels of exterior-to-interior noise attenuation, with windows opened. Therefore, proposed project building structures exposed to exterior noise levels greater than 60 CNEL could be subject to interior noise levels exceeding the 45 CNEL noise limit for residential habitable space.

Future noise levels will exceed 60 CNEL at all of the proposed exterior building facades, located on the second level. Due to the elevated worst-case exterior traffic noise level impacts at these buildings, an exterior-to-interior noise analysis was conducted to evaluate the sound reduction properties of proposed exterior wall, window, and door construction designs. Please refer to Appendix B: Exterior-to-Interior Noise Analysis.

The architectural building plan specifications, according to Mark Hodges the project manager, the typical exterior wall assembly elements incorporated into this acoustical analysis are:

- Single layer of 1-inch thick stucco
- Single layer of 5/8-inch thick shear plywood sheathing
- 2-inch wide by 4-inch deep wood studs, placed 16-inches on-center
- Single layer of 4-inch thick faced fiberglass (R-19) batt insulation
- Single layer of 1/2-inch thick Type X gypsum board

INSUL evaluation of the exterior wall proposed for this project resulted in an approximate STC rating of 43, which was incorporated into our analysis. Please refer to Appendix C: Sound Insulation Prediction Results.

Our exterior-to-interior analysis also incorporates STC 28 ½-inch thick dual insulating windows as the minimum recommended configuration. The window assembly is constructed as follows:

- ⅛-inch glass
- ¼-inch air gap
- ⅛-inch glass

The listed STC values are based on “Center-of-Glass” test data. Any window and frame configurations may be used as long as they meet or exceed the minimum STC ratings and corresponding octave band performances for the above windows. Window “Center-of-Glass” performance for the recommended windows is given in Appendix C: Sound Insulation Prediction Results.

With the proposed exterior wall assembly, window, and sliding glass door configurations specified above, all rooms will comply with interior noise code regulations, with windows and doors in a closed position. Please refer to Table 9: Future Interior Noise Levels with Mitigation Recommendations, showing future interior noise levels with the recommendations made herein.

Table 9. Future Interior Noise Levels with Mitigation Recommendations						
Location	**Room**	**Exterior Facade (CNEL)**	**Minimum Window Rating**	**Interior CNEL (windows open)**	**Interior CNEL (windows closed)**	**Mechanical Ventilation**
Northeast Corner 2nd Level	Master Bedroom	71.1/68.5	STC 28	56.1	40.9	Required
East Facade 2nd Level	Bedroom	66.1	STC 28	46.6	32.0	Required
Western Facade 2nd Level	Living Room	64.3	STC 28	43.2	29.5	Recommend ed
Northwest Corner 2nd Level	Bedroom	62.2/73.9	STC 28	56.3	40.1	Required

Mechanical ventilation, which allows windows to be closed for an extended length of time, is required to achieve future interior noise levels below 45 CNEL in all residential units. The mechanical ventilation shall meet the criteria of the Uniform Building Code (Chapter 12, Section 1203.3 of the 2001 California Building Code, based on the 1997 Uniform Building Code), including the capability to provide sufficient fresh air exchanges, as required by the Code. Fresh air must be supplied to the individual rooms through a separate supply line duct run, often referred to as a "Summer Switch" for circulation of unheated air. " Make-up air" must be supplied from the outside through a minimum 4-foot duct with two right-angle bends, interior duct insulation, or an equivalent design. The ventilation system shall not compromise the sound insulation capability of the exterior wall or be dependent on ventilation through windows.

The proposed residential spaces were analyzed for worst-case exterior noise impacts. All rooms will have satisfactory interior noise levels, if built according to the wall, window, and mechanical ventilation plans reviewed for this acoustical analysis. These interior mitigation recommendations will satisfy the acoustical requirements necessary to meet the California Code of Regulations, Title 24.

5.3 Temporary Construction Noise

Section 36.410 (b) of the County of San Diego Noise Ordinance states that construction equipment shall not be operated so as to cause noise at a level in excess of 75 dBA for more than 8 hours during any 24-hour period, when measured at the property lines. The County of San Diego Noise Specialist, John Bennett, has requested that this regulation be interpreted as follows: the average eight-hour equivalent noise level of the construction equipment shall not exceed 75 dBA.

Construction activities shall be limited to the following hours: 7 a.m. to 7 p.m., Monday through Friday (except legal holidays), and 7 a.m. to 6 p.m. on Saturday. There will be no construction activity on Sunday. Fences and gates will be installed as a control feature to limit after hours access to the construction site.

The project-related construction noise is expected to only occasionally exceed background noise levels for short durations. It is expected that standard earthmoving equipment, such as dozers, graders, tractors, and front loaders are unlikely to be used. According to Mark Hodges, the project manager, a small "bobcat" loader will be used for grading. This will create a negligible noise impact. For details on the typical noise levels created by grading equipment, please refer to Table 10: Construction Equipment Noise Levels. No proposed work schedule is available for the project at this time.

Table 10. Construction Equipment Noise Levels			
Equipment Type	Range of Noise Levels at 50 feet	Nominal Noise Level at 50 feet (Leq)	Height of Noise Source
Front Loader	71 to 96 dBA	82 dBA	12 feet

Source: Wieland Associates, 1999

Due to the small size of the “bobcat” loader and the low level of grading operations, no temporary construction noise barrier mitigation will be required for this project due to projected grading operations on the project site.

6.0 CERTIFICATION

The findings and recommendations of this acoustical analysis report are based on the information available and are a true and factual analysis of the potential acoustical issues associated with the Shellstrom Condominium project in the Community of Lakeside, County of San Diego, California. This report was prepared by Michael Burrill and Doug Eilar.

Michael Burrill, Senior Acoustical Consultant

Douglas K. Eilar, Principal

7.0 REFERENCES

1. 2001 California Building Code, Based on the 1997 Uniform Building Code, Appendix Chapter 12, Division II - Sound Transmission Control, Section 1208 - *Sound Transmission Control*.

2. 2001 California Building Code, Based on the 1997 Uniform Building Code, Chapter 12, Section 1203.3 - Ventilation.

3. 2001 California Noise Insulation Standards, effective 11/01/02, Based on 1997 Uniform Building Code, California Code of Regulations, Title 24.

4. California Department of Transportation, Sound32 Traffic Noise Model.

5. County of San Diego Noise Element to the General Plan.

6. County of San Diego Noise Ordinance

7. County of San Diego Fire Code

8. Harris, Cyril M., Handbook of Acoustical Measurements and Noise Control, 3rd Edition, Acoustical Society of America, 1998

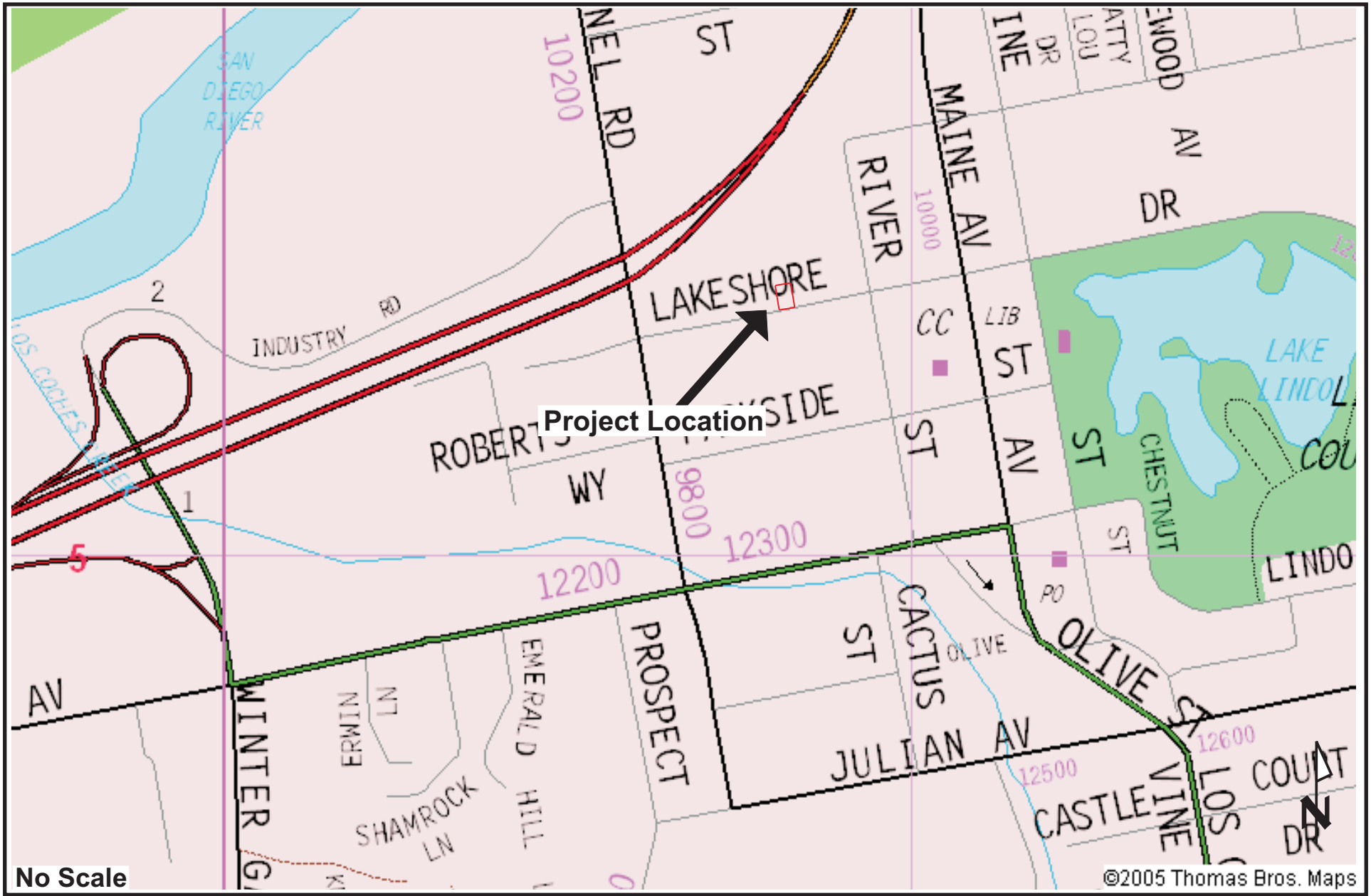
9. Heeden, Robert A., Compendium of Materials for Noise Control, U.S. Department of Health, Education and Welfare, National Institute for Occupational Safety and Health, November 1978.

10. Irvine, Leland K., Richards, Roy L., Acoustics and Noise Control Handbook for Architects and Builders, Kreiger Publishing Company, 1998

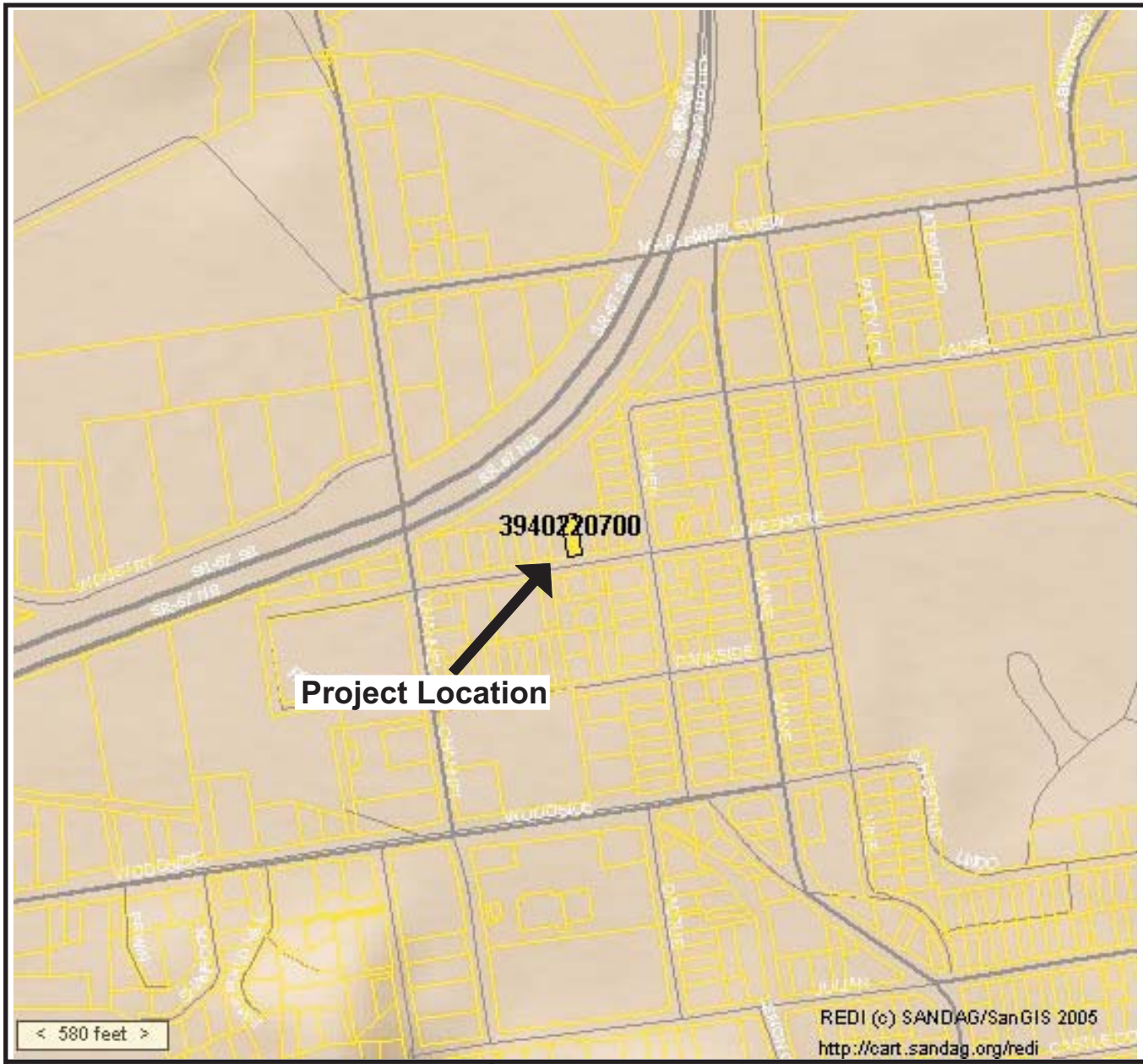
11. NBS Building Sciences Series 77, Acoustical and Thermal Performance on Exterior Residential Walls, U.S. Department of Commerce/National Bureau of Standards, November 1976.

12. Western Electro-Acoustic Laboratory, Inc., 1711 Sixteenth Street, Santa Monica, California 90404, 213-80-9268, Sound Transmission Loss Vs. Glazing Type, Window Size and Air Filtration, January 1985. The research described in this report was prepared for the California Association of Window Manufacturers, 823 North Harbor Boulevard, Suite E, Fullerton, California 92632, 714-525-7088.

Figures



Eilar Associates **539 Encinitas Boulevard, Suite 206** **Encinitas, California 92024** **760-753-1865**	**Vicinity Map** **Job # A71006N1**	**Figure 1**



APN: 394-022-07-00

N

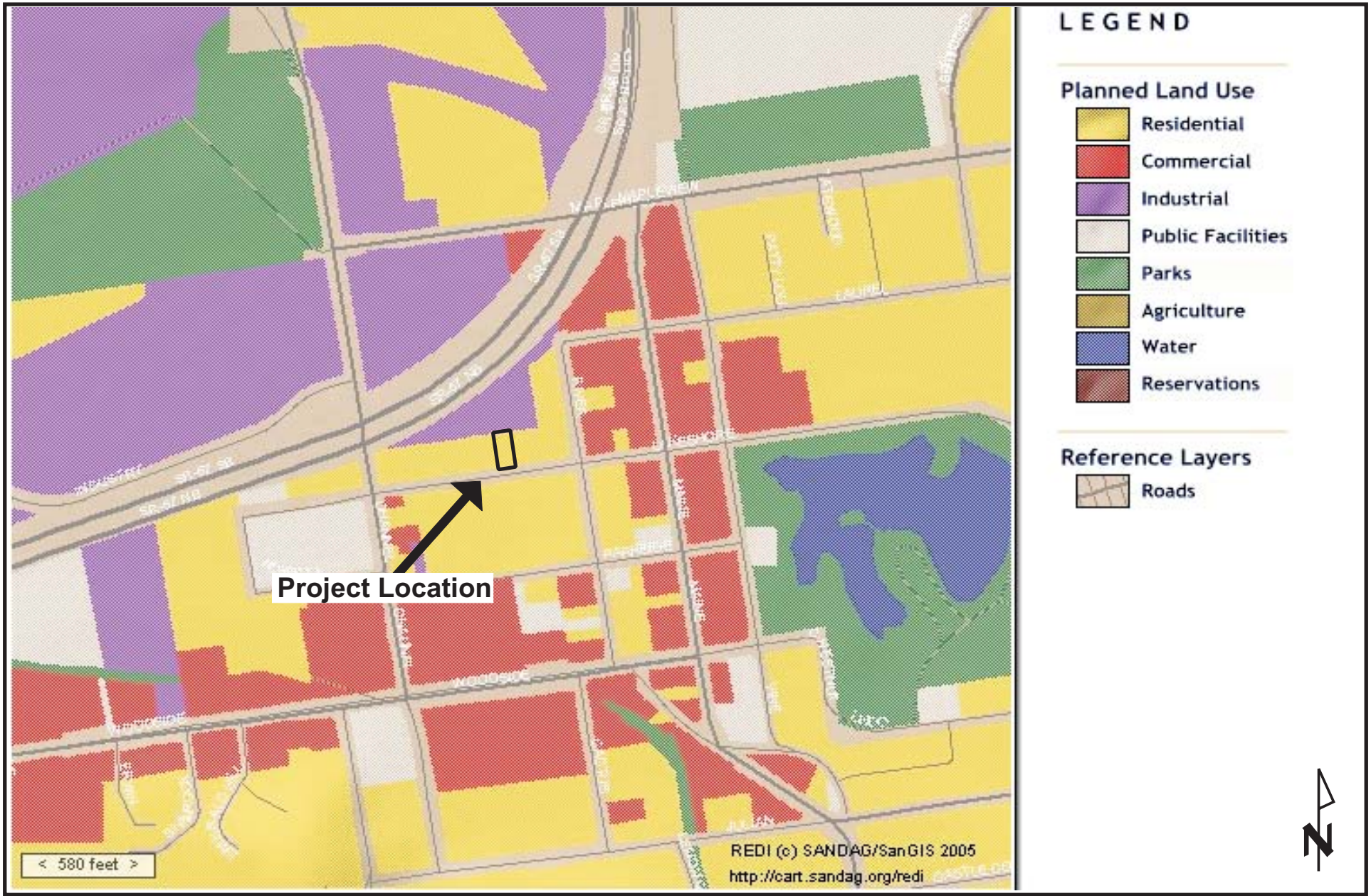
Eilar Associates **539 Encinitas Boulevard, Suite 206** **Encinitas, California 92024** **760-753-1865**	**Assessor's Parcel Map** **Job # A71006N1**	**Figure 2**

Eilar Associates **539 Encinitas Boulevard, Suite 206** **Encinitas, California 92024** **760-753-1865**	**Satellite Aerial Photograph** **Job # A71006N1**	**Figure 3**

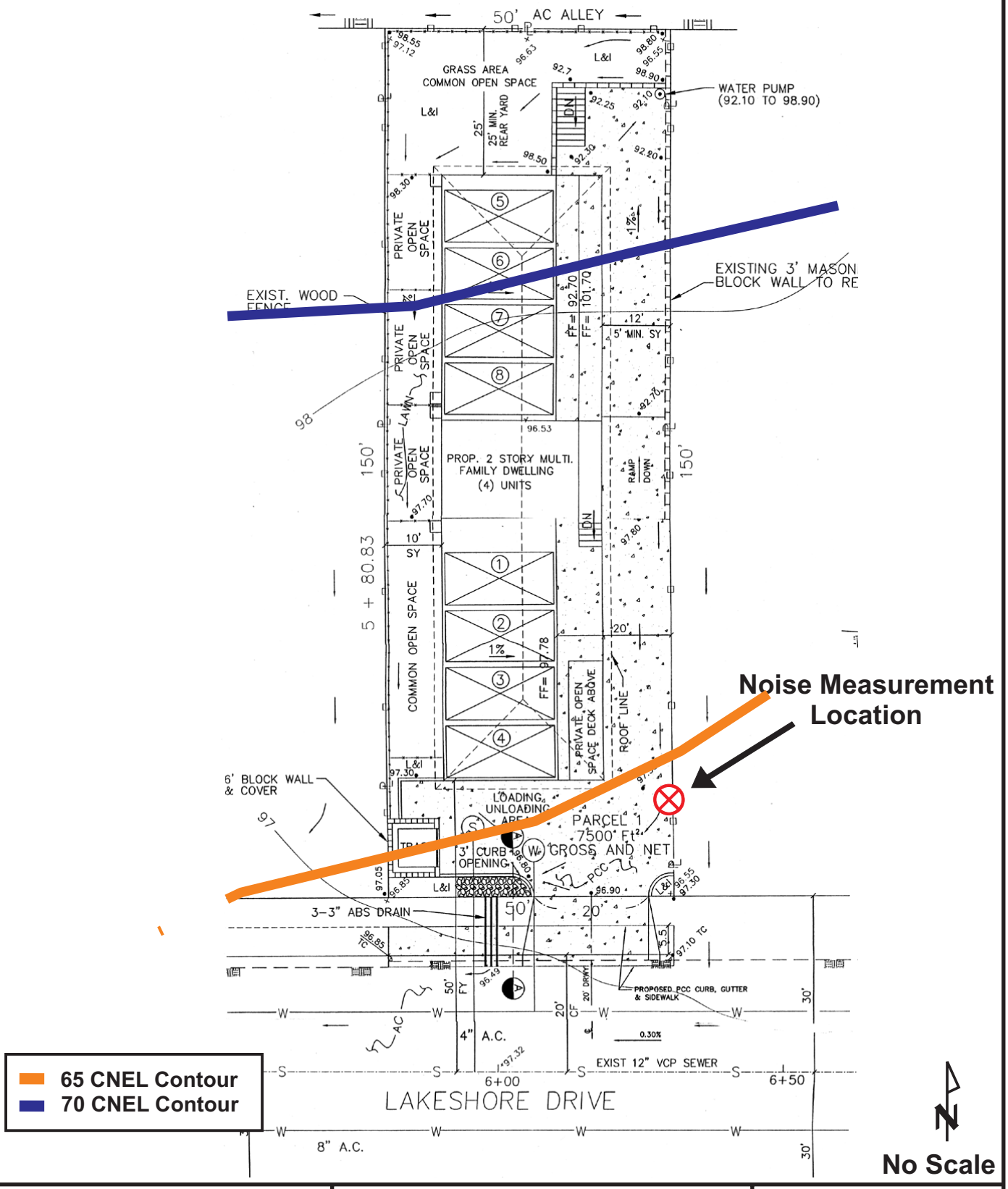
Image courtesy of the U.S. Geological Survey

m 100 200 300
yds 100 200 300

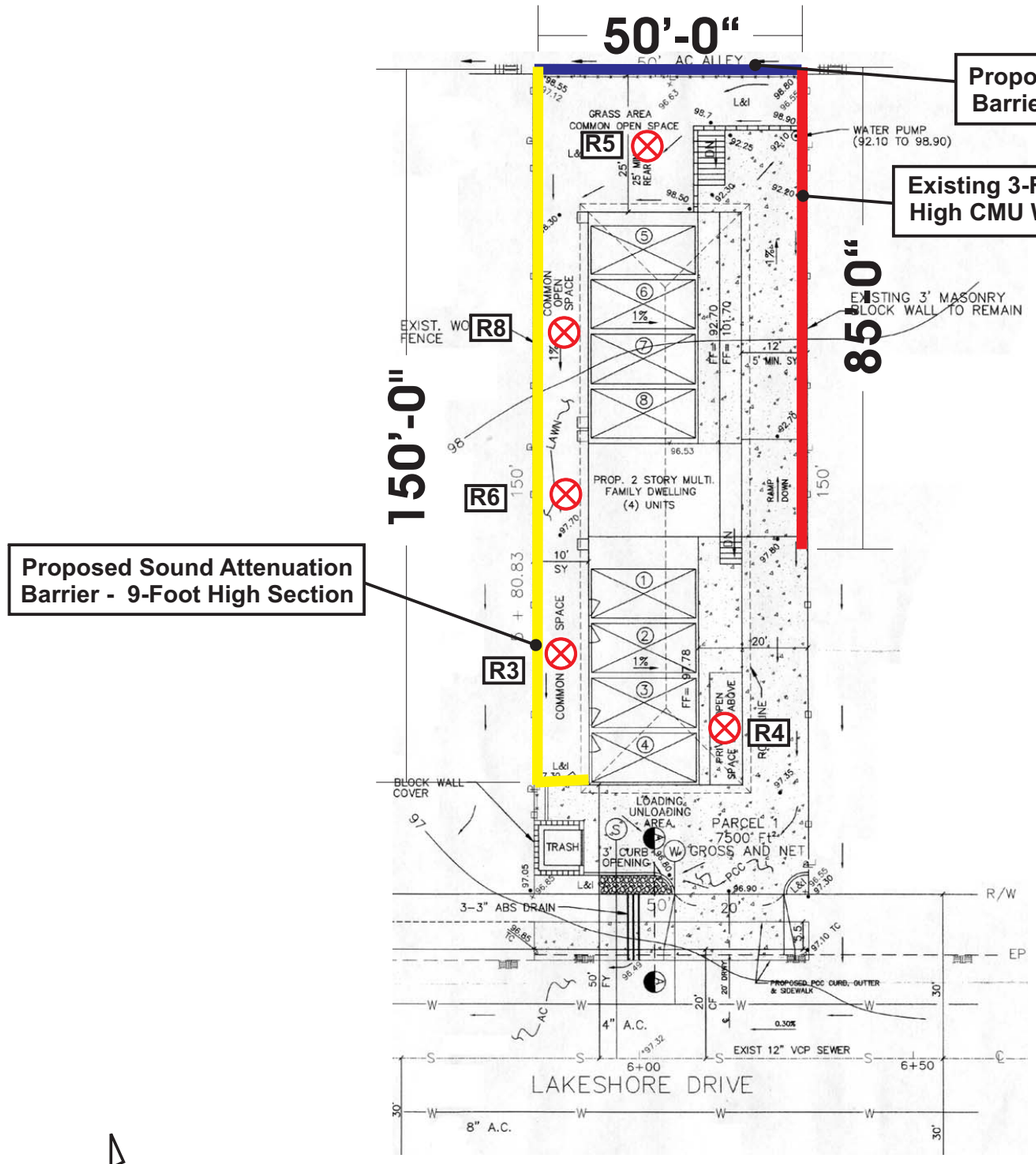
Eilar Associates **539 Encinitas Boulevard, Suite 206** **Encinitas, California 92024** **760-753-1865**	**Topographic Map** **Job # A71006N1**	**Figure 4**



Eilar Associates **539 Encinitas Boulevard, Suite 206** **Encinitas, California 92024** **760-753-1865**	**Planned Land Use Map** **Job # A71006N1**	**Figure 5**



Eilar Associates 539 Encinitas Boulevard, Suite 206 Encinitas, California 92024 760-753-1865	**Site Plan Showing Future Traffic CNEL Contours and Noise Measurement Location Job # A71006N1**	**Figure 6**

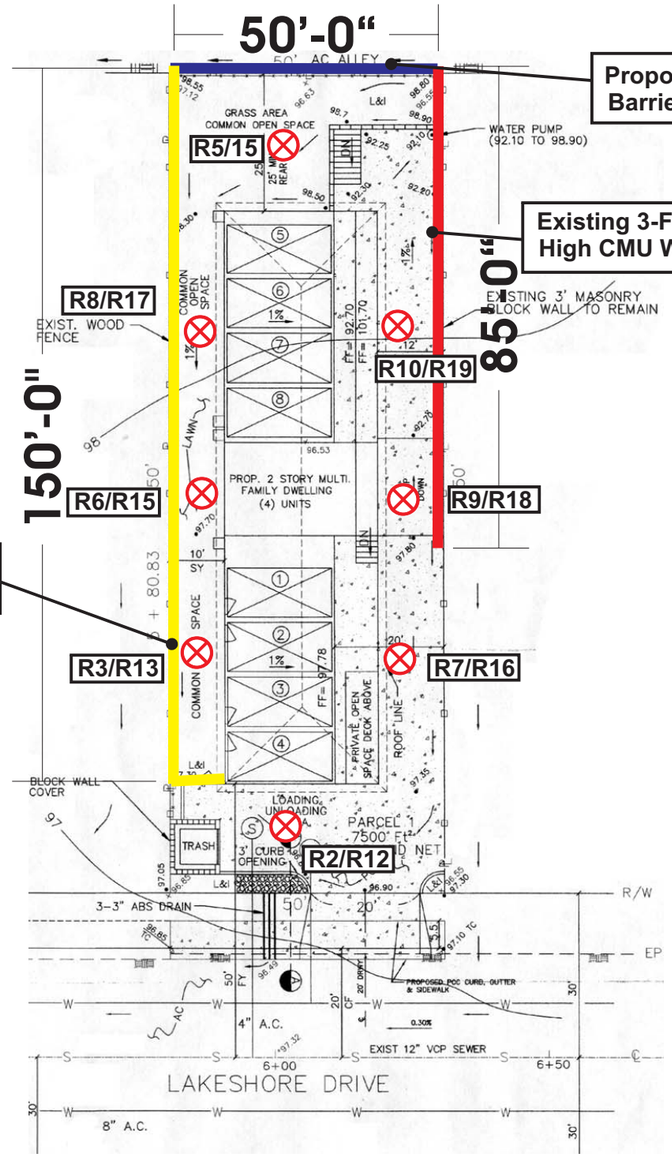


Future Traffic CNEL at Outdoor Use Areas			
Receiver	**Receiver Location**	**Exterior Traffic CNEL (Unmitigated)**	**Exterior Traffic CNEL (Mitigated)**
R-3	Southern Area of Western Common Use Space	59.0	57.6
R-4	Southeastern Second Story Balcony	48.8	48.8
R-5	Northern Common Use Space	66.1	58.3
R-6	Central Area of Western Common Use Space	59.8	57.9
R-8	Northern Area of Western Common Use Space	62.7	59.1

N

No Scale

Eilar Associates **539 Encinitas Boulevard, Suite 206** **Encinitas, California 92024** **760-753-1865**	**Site Plan Showing Future Traffic CNEL at Outdoor Use Areas with Proposed Mitigation** **Job # A71006N1**	**Figure 7**



Future Exterior Building Facade CNEL With Proposed Mitigation				
Receiver	Level	Facade Location	Exterior Traffic CNEL (Unmitigated)	Exterior Traffic CNEL (Mitigated)
R-2	1st	Southern Facade	61.4	61.4
R-3	1st	Western Facade - South	59.0	57.6
R-5	1st	Northern Facade	66.1	58.3
R-6	1st	Western Facade - Central	59.8	57.9
R-7	1st	Eastern Facade - South	62.0	60.9
R-8	1st	Western Facade - North	62.7	59.1
R-9	1st	Eastern Facade - Central	62.6	60.6
R-10	1st	Eastern Facade - North	64.1	60.0
R-12	2nd	Southern Facade	63.0	63.0
R-13	2nd	Western Facade - South	63.9	63.5
R-14	2nd	Northern Facade	71.1	71.1
R-15	2nd	Western Facade - Central	64.8	64.3
R-16	2nd	Eastern Facade - South	65.8	65.1
R-17	2nd	Western Facade - North	67.8	67.6
R-18	2nd	Eastern Facade - Central	66.9	66.1
R-19	2nd	Eastern Facade - North	68.9	68.5

N

No Scale

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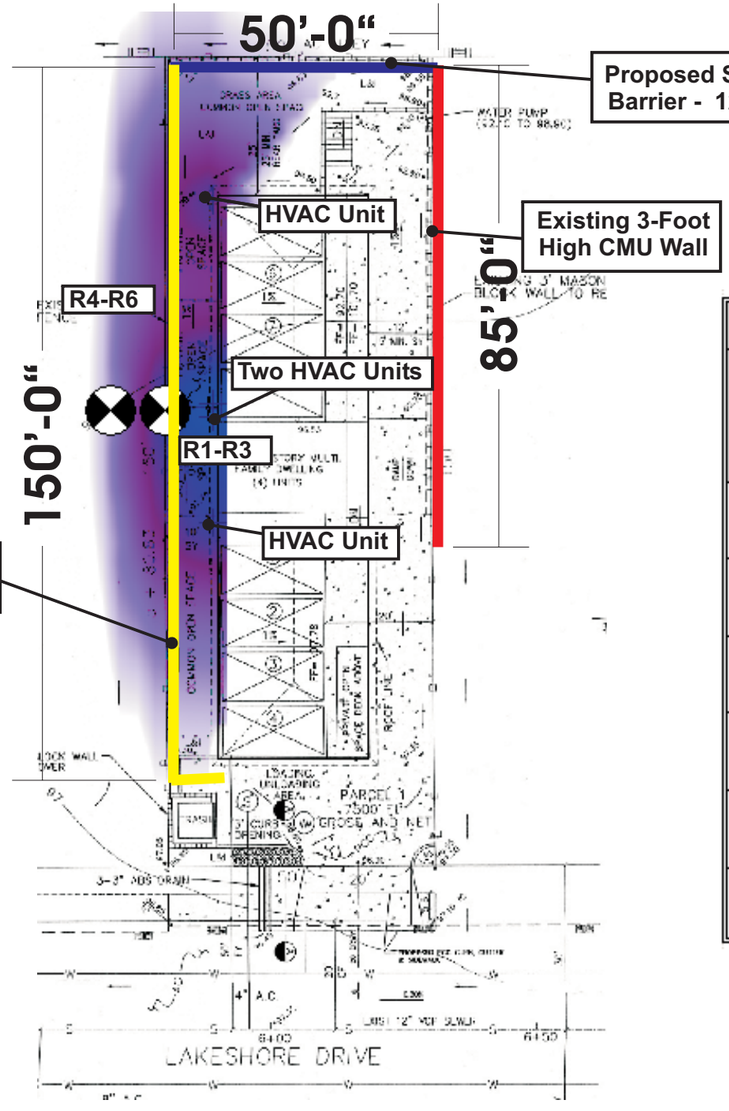
Encinitas, California 92024
760-753-1865

Site Plan Showing Future Traffic CNEL at Exterior Building Facades with Proposed Mitigation
Job # A71006N1

Figure 8



Calculated Noise Levels of a Four air Conditioning Units Including Site Features

Receiver	Location	Cadna Model Noise Level without Existing Fence (dBA)	9-Ft Barrier Insertion Loss (dBA)	Cadna Model Noise Level with Existing Fence (dBA)
R-1	Western Property Line - 1st Floor	55.6	18.6	37.0
R-2	Western Property Line - 2nd Floor	54.1	1.1	53.0
R-3	Western Property Line - 3rd Floor	51.9	0.0	51.9
R-4	10-ft Beyond Western Property Line - 1st Floor	49.8	16.1	33.7
R-5	10-ft Beyond Western Property Line - 2nd Floor	49.5	11.7	37.8
R-6	10-ft Beyond Western Property Line - 3rd Floor	48.7	4.8	43.9

N

No Scale

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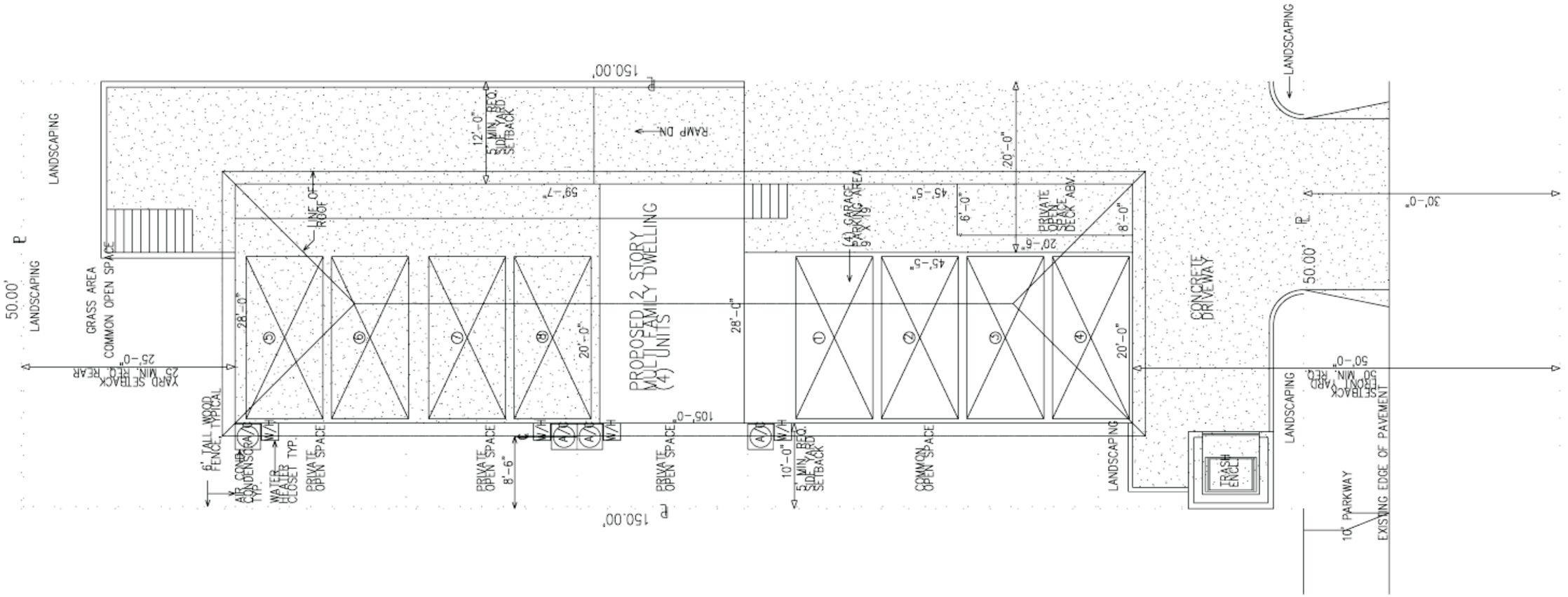
Site Plan Showing Property Line Noise Impacts and A/C Unit Locations
Job # A71006N1

Figure 9A



No Scale

Eilar Associates **539 Encinitas Boulevard, Suite 206** **Encinitas, California 92024** **760-753-1865**	**Site Plan Showing Property Line Distances and A/C Unit Locations** **Job # A71006N1**	**Figure 9B**

APPENDIX A

Sound32 Data and Results

Sound 32 Data and Results

Shellstrom Condominiums

On-Site Noise Measurement Conditions and Results	
Date	Friday, November 5, 2005
Time	2:45 p.m. - 3:00 p.m.
Conditions	Clear Skies, Winds from the West @ 3-4 mph, Temperature High 70's with Low Humidity
Measured Noise Level	62.5 dBA L_{EQ}

Traffic Count During On-Site Noise Measurement						
Roadway		**Duration**	**Autos**	**Medium**	**Heavy**	**Totals**
SR- 67 North	Measured	15 Min.	238	7	2	247
	Overall	60 Min.	952	28	8	988
SR- 67 South	Measured	15 Min.	238	7	2	247
	Overall	60 Min.	952	28	8	988
Lakeshore Drive	Measured	15 Min.	76	9	2	87
	Overall	60 Min.	304	36	8	348

Noise Level Comparison Using Traffic Model versus On-Site Noise Measurement				
Roadways	**Calculated**	**Measured**	**Difference**	**Correction**
Lakeshore Drive and SR- 67	62.6 dBA L_{EQ}	62.5 dBA L_{EQ}	0.1 dB	none

Current Traffic Reference Information

- Current traffic ADTs for Lakeshore Drive and SR- 67 were obtained from the San Diego Association of Governments Department of Transportation Website (http://www.sandag.org.)

Future Traffic Reference Information

- Future (year 2030) traffic ADTs for Lakeshore Drive and SR- 67 were obtained from the San Diego Association of Governments Department of Transportation Website (http://www.sandag.org.)

- Current and future truck percentages were provided by Larry Horsman, San Diego County Traffic Engineer.

Overall Traffic Information				
Roadway Name	Speed Limit		Current ADT	Future (2030) ADT
	Current	Future		
Lakeshore Drive	25	30	6,000	6,000
SR-67 Southbound	65	65	22,000	32,000
SR-67 Northbound	65	65	21,000	37,000

Current (2004) Traffic Conditions					
Roadway Name	Condition	Total % ADT	Autos (Hourly)	Medium (Hourly)	Heavy (Hourly)
Lakeshore Drive	Current	100	97.0%	2.0%	1.0%
		6,000	337	6	3
SR-67 Southbound	Current	100	92.0%	5.0%	3.0%
		22,000	1224	38	12
SR-67 Northbound	Current	100	92.0%	5.0%	3.0%
		21,000	723	22	7

Future (2030) Traffic Conditions					
Roadway Name	Condition	Total % ADT	Autos (Hourly)	Medium (Hourly)	Heavy (Hourly)
Lakeshore Drive	Future	100	97.0%	2.0%	1.0%
		6,000	337	6	3
SR-67 Southbound	Future	100	92.0%	5.0%	3.0%
		32,000	1712	93	55
SR-67 Northbound	Future	100	92.0%	5.0%	3.0%
		37,000	1974	107	64

****

SOUND32 PROGRAM DATA FOR CALTRANS VERSION OF STAMINA2/OPTIMA

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Measured On-Site Traffic Noise Data for Calibration

****

* * SOUND32 (CALTRANS VERSION OF STAMINA2/OPTIMA) * *

INPUT DATA FILE : MEASURED
BARRIER COST FILE : CALIF$.DTA
DATE : 01-06-2006

Untitled

==========

TRAFFIC DATA

LANE NO.	AUTO VPH	AUTO MPH	MEDIUM TRKS VPH	MEDIUM TRKS MPH	HEAVY TRKS VPH	HEAVY TRKS MPH	DESCRIPTION
1	304	25	36	25	8	25	LAKESHORE DR RESIDENTIAL
2	952	65	28	65	8	65	Highway 67 North
3	952	65	28	65	8	65	HIGHWAY 67 SOUTH

==========

LANE DATA

LANE NO.	SEG. NO.	GRADE COR.	X	Y	Z	SEGMENT DESCRIPTION
1	1	NO	-500.0	0.0	400.0	L1 P1
			500.0	0.0	400.0	L1 P2
2	1	NO	-450.0	300.0	420.0	L2 P1
	2	NO	0.0	450.0	420.0	L2 P2
			260.0	550.0	420.0	L2 P3
3	1	NO	-450.0	365.0	420.0	L3 P1
	2	NO	0.0	515.0	420.0	L3 P2
			260.0	615.0	420.0	L3 P3

==========

BARRIER DATA

Barrier No. 1 Description: FREEWAY BERM
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-450.0	290.0	0.0	420.0	*B1 P1 * %420
2	0.0	440.0	0.0	420.0	*B1 P2 * %420
	260.0	540.0	0.0	420.0	*B1 P3 * %420

Barrier No. 2 Description: NEIGHBOR 1
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-10.0	160.0	400.0	420.0 *B2 P1	* 20
2	-50.0	160.0	400.0	420.0 *B2 P2	* 20
3	-50.0	60.0	400.0	420.0 *B2 P3	* 20
4	-10.0	60.0	400.0	420.0 *B2 P4	* 20
	-10.0	160.0	400.0	420.0 *B2 P5	* 20

Barrier No. 3 Description: NEIGHBOR ACROSS
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-400.0	-50.0	400.0	425.0 *B3 P1	* 25
2	-100.0	-50.0	400.0	425.0 *B3 P2	* 25
3	-100.0	-200.0	400.0	425.0 *B3 P3	* 25
4	-400.0	-200.0	400.0	425.0 *B3 P4	* 25
	-400.0	-50.0	400.0	425.0 *B3 P5	* 25

Barrier No. 4 Description: NEIGHBOR ACROSS 2
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-20.0	-50.0	400.0	425.0 *B4 P1	* 25
2	-20.0	-200.0	400.0	425.0 *B4 P2	* 25
3	280.0	-200.0	400.0	425.0 *B4 P3	* 25
4	280.0	-50.0	400.0	425.0 *B4 P4	* 25
	-20.0	-50.0	400.0	425.0 *B4 P5	* 25

Barrier No. 5 Description: NEIGHBOR 2
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-60.0	160.0	400.0	420.0 *B5 P1	* 20
2	-100.0	160.0	400.0	420.0 *B5 P2	* 20
3	-100.0	60.0	400.0	420.0 *B5 P3	* 20
4	-60.0	60.0	400.0	420.0 *B5 P4	* 20
	-60.0	160.0	400.0	420.0 *B5 P5	* 20

Barrier No. 6 Description: NEIGHBOR 3
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-110.0	160.0	400.0	420.0 *B6 P1	* 20
2	-150.0	160.0	400.0	420.0 *B6 P2	* 20
3	-150.0	60.0	400.0	420.0 *B6 P3	* 20
4	-110.0	60.0	400.0	420.0 *B6 P4	* 20
	-110.0	160.0	400.0	420.0 *B6 P5	* 20

Barrier No. 7 Description: NEXT DOOR`
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	100.0	60.0	400.0	410.0 *B7 P1	* 10
2	100.0	150.0	400.0	410.0 *B7 P2	* 10
3	150.0	150.0	400.0	410.0 *B7 P3	* 10
4	150.0	60.0	400.0	410.0 *B7 P4	* 10
	100.0	60.0	400.0	410.0 *B7 P5	* 10

RECEIVER DATA

REC. NO.	X	Y	Z	DNL	PEOPLE	ID
1	60.0	50.0	405.0	67	500	R-1

DROP-OFF RATES
ALL LANE/RECEIVER PAIRS = 3.0 DBA

K - CONSTANTS
ALL LANE RECEIVER/PAIRS = 0.0 DBA

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	R-1	67.	500.	62.6

****

Current Traffic Noise Data

****

* * SOUND32 (CALTRANS VERSION OF STAMINA2/OPTIMA) * *

INPUT DATA FILE : CURRENT
BARRIER COST FILE : CALIF$.DTA
DATE : 01-09-2006

Untitled

TRAFFIC DATA

LANE NO.	AUTO VPH	AUTO MPH	MEDIUM TRKS VPH	MEDIUM TRKS MPH	HEAVY TRKS VPH	HEAVY TRKS MPH	DESCRIPTION
1	337	25	6	25	3	25	LAKESHORE DR RESIDENTIAL
2	723	65	22	65	7	65	Highway 67 North
3	1224	65	38	65	12	65	HIGHWAY 67 SOUTH

LANE DATA

LANE NO.	SEG. NO.	GRADE COR.	X	Y	Z	SEGMENT DESCRIPTION
1	1	NO	-500.0	0.0	400.0	L1 P1
			500.0	0.0	400.0	L1 P2
2	1	NO	-450.0	300.0	420.0	L2 P1
	2	NO	0.0	450.0	420.0	L2 P2
			260.0	550.0	420.0	L2 P3
3	1	NO	-450.0	365.0	420.0	L3 P1
	2	NO	0.0	515.0	420.0	L3 P2
			260.0	615.0	420.0	L3 P3

==========

BARRIER DATA

Barrier No. 1 Description: FREEWAY BERM
Type - (1)BERM
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-450.0	290.0	0.0	420.0 *B1 P1	* %420
2	0.0	440.0	0.0	420.0 *B1 P2	* %420
	260.0	540.0	0.0	420.0 *B1 P3	* %420

Barrier No. 2 Description: NEIGHBOR 1
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-10.0	160.0	400.0	420.0 *B2 P1	* 20
2	-50.0	160.0	400.0	420.0 *B2 P2	* 20
3	-50.0	60.0	400.0	420.0 *B2 P3	* 20
4	-10.0	60.0	400.0	420.0 *B2 P4	* 20
	-10.0	160.0	400.0	420.0 *B2 P5	* 20

Barrier No. 3 Description: NEIGHBOR ACROSS
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-400.0	-50.0	400.0	425.0 *B3 P1	* 25
2	-100.0	-50.0	400.0	425.0 *B3 P2	* 25
3	-100.0	-200.0	400.0	425.0 *B3 P3	* 25
4	-400.0	-200.0	400.0	425.0 *B3 P4	* 25
	-400.0	-50.0	400.0	425.0 *B3 P5	* 25

Barrier No. 4 Description: NEIGHBOR ACROSS 2
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-20.0	-50.0	400.0	425.0 *B4 P1	* 25
2	-20.0	-200.0	400.0	425.0 *B4 P2	* 25
3	280.0	-200.0	400.0	425.0 *B4 P3	* 25
4	280.0	-50.0	400.0	425.0 *B4 P4	* 25
	-20.0	-50.0	400.0	425.0 *B4 P5	* 25

```
--------------------------------------------------------------------------------
Barrier No.  5            Description: NEIGHBOR 2
Type - (2)MASONRY
Height Increment (DELZ)= 0.0          No. Height Changes (P)=0

                                GROUND      TOP           BARRIER
SEG.        X          Y         (Z0)       (Z)           HEIGHTS AT ENDS
--------------------------------------------------------------------------------
 1       -60.0      160.0      400.0      420.0 *B5 P1   * 20
 2      -100.0      160.0      400.0      420.0 *B5 P2   * 20
 3      -100.0       60.0      400.0      420.0 *B5 P3   * 20
 4       -60.0       60.0      400.0      420.0 *B5 P4   * 20
         -60.0      160.0      400.0      420.0 *B5 P5   * 20

--------------------------------------------------------------------------------
Barrier No.  6            Description: NEIGHBOR 3
Type - (2)MASONRY
Height Increment (DELZ)= 0.0          No. Height Changes (P)=0

                                GROUND      TOP           BARRIER
SEG.        X          Y         (Z0)       (Z)           HEIGHTS AT ENDS
--------------------------------------------------------------------------------
 1      -110.0      160.0      400.0      420.0 *B6 P1   * 20
 2      -150.0      160.0      400.0      420.0 *B6 P2   * 20
 3      -150.0       60.0      400.0      420.0 *B6 P3   * 20
 4      -110.0       60.0      400.0      420.0 *B6 P4   * 20
        -110.0      160.0      400.0      420.0 *B6 P5   * 20

--------------------------------------------------------------------------------
Barrier No.  7            Description: NEXT DOOR`
Type - (2)MASONRY
Height Increment (DELZ)= 0.0          No. Height Changes (P)=0

                                GROUND      TOP           BARRIER
SEG.        X          Y         (Z0)       (Z)           HEIGHTS AT ENDS
--------------------------------------------------------------------------------
 1       100.0       60.0      400.0      410.0 *B7 P1   * 10
 2       100.0      150.0      400.0      410.0 *B7 P2   * 10
 3       150.0      150.0      400.0      410.0 *B7 P3   * 10
 4       150.0       60.0      400.0      410.0 *B7 P4   * 10
         100.0       60.0      400.0      410.0 *B7 P5   * 10

--------------------------------------------------------------------------------
================================================================================

RECEIVER DATA
-------------
REC.
 NO.          X          Y          Z    DNL PEOPLE   ID
--------------------------------------------------------------------------------
  1        60.0       50.0      405.0    67   500    R-1
================================================================================

DROP-OFF RATES
--------------
ALL LANE/RECEIVER PAIRS =  3.0 DBA
================================================================================

K - CONSTANTS
-------------
ALL LANE RECEIVER/PAIRS =   0.0 DBA
================================================================================
REC REC ID    DNL  PEOPLE   LEQ(CAL)
---------------------------------
 1  R-1       67.    500.   59.8
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Future Traffic ADT, Without Building Facades to Produce Contours

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* * SOUND32 (CALTRANS VERSION OF STAMINA2/OPTIMA) * *

INPUT DATA FILE : CONTOUR.TXT
BARRIER COST FILE : CALIF$.DTA
DATE : 08-01-2006

Untitled

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TRAFFIC DATA

LANE NO.	AUTO VPH	AUTO MPH	MEDIUM TRKS VPH	MEDIUM TRKS MPH	HEAVY TRKS VPH	HEAVY TRKS MPH	DESCRIPTION
1	337	30	6	30	3	30	LAKESHORE DR RESIDENTIAL
2	1974	65	107	65	64	65	Highway 67 North
3	1712	65	93	65	55	65	HIGHWAY 67 SOUTH

==========

LANE DATA

LANE NO.	SEG. NO.	GRADE COR.	X	Y	Z	SEGMENT DESCRIPTION
1	1	NO	-500.0	0.0	400.0	L1 P1
			500.0	0.0	400.0	L1 P2
2	1	NO	-450.0	300.0	420.0	L2 P1
	2	NO	0.0	450.0	420.0	L2 P2
			260.0	550.0	420.0	L2 P3
3	1	NO	-450.0	365.0	420.0	L3 P1
	2	NO	0.0	515.0	420.0	L3 P2
			260.0	615.0	420.0	L3 P3

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BARRIER DATA

Barrier No. 1 Description: NEIGHBOR 1
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-10.0	160.0	400.0	420.0 *B1 P1	* 20
2	-50.0	160.0	400.0	420.0 *B1 P2	* 20
3	-50.0	60.0	400.0	420.0 *B1 P3	* 20
4	-10.0	60.0	400.0	420.0 *B1 P4	* 20
	-10.0	160.0	400.0	420.0 *B1 P5	* 20

Barrier No. 2 Description: NEIGHBOR ACROSS
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-400.0	-50.0	400.0	425.0 *B2 P1	* 25
2	-100.0	-50.0	400.0	425.0 *B2 P2	* 25
3	-100.0	-200.0	400.0	425.0 *B2 P3	* 25
4	-400.0	-200.0	400.0	425.0 *B2 P4	* 25
	-400.0	-50.0	400.0	425.0 *B2 P5	* 25

Barrier No. 3 Description: NEIGHBOR ACROSS 2
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-20.0	-50.0	400.0	425.0 *B3 P1	* 25
2	-20.0	-200.0	400.0	425.0 *B3 P2	* 25
3	280.0	-200.0	400.0	425.0 *B3 P3	* 25
4	280.0	-50.0	400.0	425.0 *B3 P4	* 25
	-20.0	-50.0	400.0	425.0 *B3 P5	* 25

Barrier No. 4 Description: NEIGHBOR 2
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-60.0	160.0	400.0	420.0 *B4 P1	* 20
2	-100.0	160.0	400.0	420.0 *B4 P2	* 20
3	-100.0	60.0	400.0	420.0 *B4 P3	* 20
4	-60.0	60.0	400.0	420.0 *B4 P4	* 20
	-60.0	160.0	400.0	420.0 *B4 P5	* 20

Barrier No. 5 Description: NEIGHBOR 3
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-110.0	160.0	400.0	420.0 *B5 P1	* 20
2	-150.0	160.0	400.0	420.0 *B5 P2	* 20
3	-150.0	60.0	400.0	420.0 *B5 P3	* 20
4	-110.0	60.0	400.0	420.0 *B5 P4	* 20
	-110.0	160.0	400.0	420.0 *B5 P5	* 20

Barrier No. 6 Description: NEXT DOOR`
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	100.0	60.0	400.0	410.0 *B6 P1	* 10
2	100.0	150.0	400.0	410.0 *B6 P2	* 10
3	150.0	150.0	400.0	410.0 *B6 P3	* 10
4	150.0	60.0	400.0	410.0 *B6 P4	* 10
	100.0	60.0	400.0	410.0 *B6 P5	* 10

RECEIVER DATA

REC. NO.	X	Y	Z	DNL	PEOPLE	ID
1	60.0	50.0	405.0	67	500	R-1
2	0.0	175.0	405.0	67	500	R-2
3	40.0	50.0	405.0	67	500	R-3
4	20.0	50.0	405.0	67	500	R-4
5	0.0	50.0	405.0	67	500	R-5
6	0.0	75.0	405.0	67	500	R-6
7	20.0	75.0	405.0	67	500	R-7
8	40.0	75.0	405.0	67	500	R-8
9	60.0	75.0	405.0	67	500	R-9
10	20.0	175.0	405.0	67	500	R-10
11	0.0	100.0	405.0	67	500	R-11
12	20.0	100.0	405.0	67	500	R-12
13	40.0	100.0	405.0	67	500	R-13
14	60.0	100.0	405.0	67	500	R-14
15	40.0	175.0	405.0	67	500	R-15
16	0.0	125.0	405.0	67	500	R-16
17	20.0	125.0	405.0	67	500	R-17
18	40.0	125.0	405.0	67	500	R-18
19	60.0	125.0	405.0	67	500	R-19
20	60.0	175.0	405.0	67	500	R-20
21	0.0	150.0	405.0	67	500	R-21
22	20.0	150.0	405.0	67	500	R-22
23	40.0	150.0	405.0	67	500	R-23
24	60.0	150.0	405.0	67	500	R-24

DROP-OFF RATES

ALL LANE/RECEIVER PAIRS = 3.0 DBA

K - CONSTANTS

ALL LANE RECEIVER/PAIRS = 0.0 DBA

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	R-1	67.	500.	66.2
2	R-2	67.	500.	69.7
3	R-3	67.	500.	65.9
4	R-4	67.	500.	65.4
5	R-5	67.	500.	64.7
6	R-6	67.	500.	64.4
7	R-7	67.	500.	65.5
8	R-8	67.	500.	66.1
9	R-9	67.	500.	66.5
10	R-10	67.	500.	69.5
11	R-11	67.	500.	64.7
12	R-12	67.	500.	66.0
13	R-13	67.	500.	66.7
14	R-14	67.	500.	67.1
15	R-15	67.	500.	69.4
16	R-16	67.	500.	65.6
17	R-17	67.	500.	67.2
18	R-18	67.	500.	67.8
19	R-19	67.	500.	68.0
20	R-20	67.	500.	69.2
21	R-21	67.	500.	68.0
22	R-22	67.	500.	69.0
23	R-23	67.	500.	68.9
24	R-24	67.	500.	68.7

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Future Traffic ADT, With Building Facades to Produce Exterior Noise Levels

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* * SOUND32 (CALTRANS VERSION OF STAMINA2/OPTIMA) * *

INPUT DATA FILE : FUTMB.TXT
BARRIER COST FILE : CALIF$.DTA
DATE : 10-17-2007

FUTMB.TXT

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TRAFFIC DATA

LANE NO.	AUTO VPH	AUTO MPH	MEDIUM TRKS VPH	MEDIUM TRKS MPH	HEAVY TRKS VPH	HEAVY TRKS MPH	DESCRIPTION
1	337	30	6	30	3	30	LAKESHORE DR RESIDENTIAL
2	1974	65	107	65	64	65	Highway 67 North
3	1712	65	93	65	55	65	HIGHWAY 67 SOUTH

==========

LANE DATA

LANE NO.	SEG. NO.	GRADE COR.	X	Y	Z	SEGMENT DESCRIPTION
1	1	NO	-500.0	0.0	400.0	L1 P1
			500.0	0.0	400.0	L1 P2
2	1	NO	-450.0	300.0	420.0	L2 P1
	2	NO	0.0	450.0	420.0	L2 P2
			260.0	550.0	420.0	L2 P3
3	1	NO	-450.0	365.0	420.0	L3 P1
	2	NO	0.0	515.0	420.0	L3 P2
			260.0	615.0	420.0	L3 P3

==========

BARRIER DATA

Barrier No. 1 Description: NEIGHBOR 1
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-10.0	160.0	0.0	420.0 *B1 P1	* %420
2	-50.0	160.0	0.0	420.0 *B1 P2	* %420
3	-50.0	60.0	0.0	420.0 *B1 P3	* %420
4	-10.0	60.0	0.0	420.0 *B1 P4	* %420
	-10.0	160.0	0.0	420.0 *B1 P5	* %420

Barrier No. 2 Description: NEIGHBOR ACROSS
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-400.0	-50.0	0.0	425.0 *B2 P1	* %425
2	-100.0	-50.0	0.0	425.0 *B2 P2	* %425
3	-100.0	-200.0	0.0	425.0 *B2 P3	* %425
4	-400.0	-200.0	0.0	425.0 *B2 P4	* %425
	-400.0	-50.0	0.0	425.0 *B2 P5	* %425

Barrier No. 3 Description: NEIGHBOR ACROSS 2
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-20.0	-50.0	0.0	425.0 *B3 P1	* %425
2	-20.0	-200.0	0.0	425.0 *B3 P2	* %425
3	280.0	-200.0	0.0	425.0 *B3 P3	* %425
4	280.0	-50.0	0.0	425.0 *B3 P4	* %425
	-20.0	-50.0	0.0	425.0 *B3 P5	* %425

Barrier No. 4 Description: NEIGHBOR 2
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-60.0	160.0	0.0	420.0 *B4 P1	* %420
2	-100.0	160.0	0.0	420.0 *B4 P2	* %420
3	-100.0	60.0	0.0	420.0 *B4 P3	* %420
4	-60.0	60.0	0.0	420.0 *B4 P4	* %420
	-60.0	160.0	0.0	420.0 *B4 P5	* %420

Barrier No. 5 Description: NEIGHBOR 3
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-110.0	160.0	0.0	420.0 *B5 P1	* %420
2	-150.0	160.0	0.0	420.0 *B5 P2	* %420
3	-150.0	60.0	0.0	420.0 *B5 P3	* %420
4	-110.0	60.0	0.0	420.0 *B5 P4	* %420
	-110.0	160.0	0.0	420.0 *B5 P5	* %420

Barrier No. 6 Description: NEXT DOOR`
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	100.0	60.0	0.0	410.0 *B6 P1	* %410
2	100.0	150.0	0.0	410.0 *B6 P2	* %410
3	150.0	150.0	0.0	410.0 *B6 P3	* %410
4	150.0	60.0	0.0	410.0 *B6 P4	* %410
	100.0	60.0	0.0	410.0 *B6 P5	* %410

Barrier No. 7 Description: MAIN BUIDING 1
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	10.0	60.0	0.0	410.0 *B7 P1	* %410
2	10.0	150.0	0.0	410.0 *B7 P2	* %410
3	45.0	150.0	0.0	410.0 *B7 P3	* %410
4	45.0	60.0	0.0	410.0 *B7 P4	* %410
	10.0	60.0	0.0	410.0 *B7 P5	* %410

Barrier No. 8   Description: MAIN BUIDING 2
Type - (2)MASONRY
Height Increment (DELZ)= 0.0   No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	10.0	60.0	0.0	425.0 *B8 P1	* %425
2	10.0	150.0	0.0	425.0 *B8 P2	* %425
3	45.0	150.0	0.0	425.0 *B8 P3	* %425
4	45.0	80.8	0.0	425.0 *B8 P4	* %425
5	39.0	80.8	0.0	425.0 *B8 P5	* %425
6	39.0	60.0	0.0	425.0 *B8 P6	* %425
	10.0	60.0	0.0	425.0 *B8 P7	* %425

Barrier No. 9   Description: SOUTHEASTERN BALCONY
Type - (2)MASONRY
Height Increment (DELZ)= 0.0   No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	45.0	80.8	420.0	425.0 *B9 P1	* 5
2	39.0	80.8	420.0	425.0 *B9 P2	* 5
3	39.0	60.0	420.0	425.0 *B9 P3	* 5
4	45.0	60.0	420.0	425.0 *B9 P4	* 5
	45.0	80.8	420.0	425.0 *B9 P5	* 5

Barrier No. 10   Description: FENCE
Type - (2)MASONRY
Height Increment (DELZ)= 0.0   No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	0.0	54.0	0.0	406.0 *B10 P1	* %406
2	0.0	172.0	0.0	406.0 *B10 P2	* %406
3	0.0	172.0	0.0	406.0 *B10 P3	* %406
	65.0	172.0	0.0	406.0 *B10 P4	* %406

Barrier No. 11   Description: Existing 3-ft Wall
Type - (1)BERM
Height Increment (DELZ)= 0.0   No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	65.0	172.0	0.0	403.0 *B11 P1	* %403
	65.0	87.0	0.0	403.0 *B11 P2	* %403

Barrier No. 12   Description: 6-foot cmu trash wall
Type - (4)CONCRETE
Height Increment (DELZ)= 0.0   No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	9.0	54.0	0.0	406.0 *B12 P1	* %406
2	0.0	54.0	0.0	406.0 *B12 P2	* %406
3	0.0	44.0	0.0	406.0 *B12 P3	* %406
	9.0	44.0	0.0	406.0 *B12 P4	* %406

RECEIVER DATA

REC. NO.	X	Y	Z	DNL	PEOPLE	ID
1	60.0	50.0	405.0	67	500	R-1
2	15.0	50.0	405.0	67	500	R-2
3	5.0	75.0	405.0	67	500	R-3
4	42.0	72.0	415.0	67	500	R-4
5	25.0	160.0	405.0	67	500	R-5
6	5.0	103.0	405.0	67	500	R-6
7	52.0	103.0	405.0	67	500	R-7
8	5.0	133.0	405.0	67	500	R-8
9	52.0	125.0	405.0	67	500	R-9
10	52.0	141.0	405.0	67	500	R-10
11	60.0	50.0	415.0	67	500	R-11
12	15.0	50.0	415.0	67	500	R-12
13	5.0	75.0	415.0	67	500	R-13
14	25.0	160.0	415.0	67	500	R-14
15	5.0	103.0	415.0	67	500	R-15
16	52.0	103.0	415.0	67	500	R-16
17	5.0	133.0	415.0	67	500	R-17
18	52.0	125.0	415.0	67	500	R-18
19	52.0	141.0	415.0	67	500	R-19

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	R-1	67.	500.	63.4
2	R-2	67.	500.	59.4
3	R-3	67.	500.	57.0
4	R-4	67.	500.	48.8
5	R-5	67.	500.	64.1
6	R-6	67.	500.	57.8
7	R-7	67.	500.	60.0
8	R-8	67.	500.	60.7
9	R-9	67.	500.	60.6
10	R-10	67.	500.	62.2
11	R-11	67.	500.	64.4
12	R-12	67.	500.	61.0
13	R-13	67.	500.	61.9
14	R-14	67.	500.	69.1
15	R-15	67.	500.	62.8
16	R-16	67.	500.	63.8
17	R-17	67.	500.	65.8
18	R-18	67.	500.	64.9
19	R-19	67.	500.	66.9

DROP-OFF RATES

ALL LANE/RECEIVER PAIRS = 3.0 DBA

K - CONSTANTS

ALL LANE RECEIVER/PAIRS = 0.0 DBA

****
Future Traffic ADT, With Mitigation to Produce Exterior Noise Levels
****

* * SOUND32 (CALTRANS VERSION OF STAMINA2/OPTIMA) * *

INPUT DATA FILE : MITMB.TXT
BARRIER COST FILE : CALIF$.DTA
DATE : 10-17-2007

MITMB.TXT

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TRAFFIC DATA

LANE NO.	AUTO VPH	AUTO MPH	MEDIUM TRKS VPH	MEDIUM TRKS MPH	HEAVY TRKS VPH	HEAVY TRKS MPH	DESCRIPTION
1	337	30	6	30	3	30	LAKESHORE DR RESIDENTIAL
2	1974	65	107	65	64	65	Highway 67 North
3	1712	65	93	65	55	65	HIGHWAY 67 SOUTH

==========

LANE DATA

LANE NO.	SEG. NO.	GRADE COR.	X	Y	Z	SEGMENT DESCRIPTION
1	1	NO	-500.0	0.0	400.0	L1 P1
			500.0	0.0	400.0	L1 P2
2	1	NO	-450.0	300.0	420.0	L2 P1
	2	NO	0.0	450.0	420.0	L2 P2
			260.0	550.0	420.0	L2 P3
3	1	NO	-450.0	365.0	420.0	L3 P1
	2	NO	0.0	515.0	420.0	L3 P2
			260.0	615.0	420.0	L3 P3

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BARRIER DATA

Barrier No. 1 Description: NEIGHBOR 1
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-10.0	160.0	0.0	420.0	*B1 P1 * %420
2	-50.0	160.0	0.0	420.0	*B1 P2 * %420
3	-50.0	60.0	0.0	420.0	*B1 P3 * %420
4	-10.0	60.0	0.0	420.0	*B1 P4 * %420
	-10.0	160.0	0.0	420.0	*B1 P5 * %420

Barrier No. 2 Description: NEIGHBOR ACROSS
Type - (2)MASONRY
Height Increment (DELZ)= 0.0 No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	-400.0	-50.0	0.0	425.0	*B2 P1 * %425
2	-100.0	-50.0	0.0	425.0	*B2 P2 * %425
3	-100.0	-200.0	0.0	425.0	*B2 P3 * %425
4	-400.0	-200.0	0.0	425.0	*B2 P4 * %425
	-400.0	-50.0	0.0	425.0	*B2 P5 * %425

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--------------------------------------------------------------------------------
Barrier No.  3            Description: NEIGHBOR ACROSS 2
Type - (2)MASONRY
Height Increment (DELZ)= 0.0          No. Height Changes (P)=0

                                GROUND      TOP           BARRIER
SEG.        X          Y         (Z0)       (Z)           HEIGHTS AT ENDS
--------------------------------------------------------------------------------
 1       -20.0      -50.0        0.0      425.0 *B3 P1   * %425
 2       -20.0     -200.0        0.0      425.0 *B3 P2   * %425
 3       280.0     -200.0        0.0      425.0 *B3 P3   * %425
 4       280.0      -50.0        0.0      425.0 *B3 P4   * %425
         -20.0      -50.0        0.0      425.0 *B3 P5   * %425

--------------------------------------------------------------------------------
Barrier No.  4            Description: NEIGHBOR 2
Type - (2)MASONRY
Height Increment (DELZ)= 0.0          No. Height Changes (P)=0

                                GROUND      TOP           BARRIER
SEG.        X          Y         (Z0)       (Z)           HEIGHTS AT ENDS
--------------------------------------------------------------------------------
 1       -60.0      160.0        0.0      420.0 *B4 P1   * %420
 2      -100.0      160.0        0.0      420.0 *B4 P2   * %420
 3      -100.0       60.0        0.0      420.0 *B4 P3   * %420
 4       -60.0       60.0        0.0      420.0 *B4 P4   * %420
         -60.0      160.0        0.0      420.0 *B4 P5   * %420

--------------------------------------------------------------------------------
Barrier No.  5            Description: NEIGHBOR 3
Type - (2)MASONRY
Height Increment (DELZ)= 0.0          No. Height Changes (P)=0

                                GROUND      TOP           BARRIER
SEG.        X          Y         (Z0)       (Z)           HEIGHTS AT ENDS
--------------------------------------------------------------------------------
 1      -110.0      160.0        0.0      420.0 *B5 P1   * %420
 2      -150.0      160.0        0.0      420.0 *B5 P2   * %420
 3      -150.0       60.0        0.0      420.0 *B5 P3   * %420
 4      -110.0       60.0        0.0      420.0 *B5 P4   * %420
        -110.0      160.0        0.0      420.0 *B5 P5   * %420

--------------------------------------------------------------------------------
Barrier No.  6            Description: NEXT DOOR`
Type - (2)MASONRY
Height Increment (DELZ)= 0.0          No. Height Changes (P)=0

                                GROUND      TOP           BARRIER
SEG.        X          Y         (Z0)       (Z)           HEIGHTS AT ENDS
--------------------------------------------------------------------------------
 1       100.0       60.0        0.0      410.0 *B6 P1   * %410
 2       100.0      150.0        0.0      410.0 *B6 P2   * %410
 3       150.0      150.0        0.0      410.0 *B6 P3   * %410
 4       150.0       60.0        0.0      410.0 *B6 P4   * %410
         100.0       60.0        0.0      410.0 *B6 P5   * %410

--------------------------------------------------------------------------------
Barrier No.  7            Description: MAIN BUIDING 1
Type - (2)MASONRY
Height Increment (DELZ)= 0.0          No. Height Changes (P)=0

                                GROUND      TOP           BARRIER
SEG.        X          Y         (Z0)       (Z)           HEIGHTS AT ENDS
--------------------------------------------------------------------------------
 1        10.0       60.0        0.0      410.0 *B7 P1   * %410
 2        10.0      150.0        0.0      410.0 *B7 P2   * %410
 3        45.0      150.0        0.0      410.0 *B7 P3   * %410
 4        45.0       60.0        0.0      410.0 *B7 P4   * %410
          10.0       60.0        0.0      410.0 *B7 P5   * %410

--------------------------------------------------------------------------------
```

Barrier No. 8   Description: MAIN BUIDING 2
Type - (2)MASONRY
Height Increment (DELZ)= 0.0   No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	10.0	60.0	0.0	425.0 *B8 P1	* %425
2	10.0	150.0	0.0	425.0 *B8 P2	* %425
3	45.0	150.0	0.0	425.0 *B8 P3	* %425
4	45.0	80.8	0.0	425.0 *B8 P4	* %425
5	39.0	80.8	0.0	425.0 *B8 P5	* %425
6	39.0	60.0	0.0	425.0 *B8 P6	* %425
	10.0	60.0	0.0	425.0 *B8 P7	* %425

Barrier No. 9   Description: SOUTHEASTERN BALCONY
Type - (2)MASONRY
Height Increment (DELZ)= 0.0   No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	45.0	80.8	420.0	425.0 *B9 P1	* 5
2	39.0	80.8	420.0	425.0 *B9 P2	* 5
3	39.0	60.0	420.0	425.0 *B9 P3	* 5
4	45.0	60.0	420.0	425.0 *B9 P4	* 5
	45.0	80.8	420.0	425.0 *B9 P5	* 5

Barrier No. 10   Description: FENCE
Type - (2)MASONRY
Height Increment (DELZ)= 0.0   No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	0.0	54.0	0.0	409.0 *B10 P1	* %409
2	0.0	172.0	0.0	409.0 *B10 P2	* %409
3	0.0	172.0	0.0	412.0 *B10 P3	* %412
	65.0	172.0	0.0	412.0 *B10 P4	* %412

Barrier No. 11   Description: Existing 3-ft Wall
Type - (1)BERM
Height Increment (DELZ)= 0.0   No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	65.0	172.0	0.0	403.0 *B11 P1	* %403
	65.0	87.0	0.0	403.0 *B11 P2	* %403

Barrier No. 12   Description: 6-foot cmu trash wall
Type - (4)CONCRETE
Height Increment (DELZ)= 0.0   No. Height Changes (P)=0

SEG.	X	Y	GROUND (Z0)	TOP (Z)	BARRIER HEIGHTS AT ENDS
1	9.0	54.0	0.0	406.0 *B12 P1	* %406
2	0.0	54.0	0.0	406.0 *B12 P2	* %406
3	0.0	44.0	0.0	406.0 *B12 P3	* %406
	9.0	44.0	0.0	406.0 *B12 P4	* %406

RECEIVER DATA

REC. NO.	X	Y	Z	DNL	PEOPLE	ID
1	60.0	50.0	405.0	67	500	R-1
2	15.0	50.0	405.0	67	500	R-2
3	5.0	75.0	405.0	67	500	R-3
4	42.0	72.0	415.0	67	500	R-4
5	25.0	160.0	405.0	67	500	R-5
6	5.0	103.0	405.0	67	500	R-6
7	52.0	103.0	405.0	67	500	R-7
8	5.0	133.0	405.0	67	500	R-8
9	52.0	125.0	405.0	67	500	R-9
10	52.0	141.0	405.0	67	500	R-10
11	60.0	50.0	415.0	67	500	R-11
12	15.0	50.0	415.0	67	500	R-12
13	5.0	75.0	415.0	67	500	R-13
14	25.0	160.0	415.0	67	500	R-14
15	5.0	103.0	415.0	67	500	R-15
16	52.0	103.0	415.0	67	500	R-16
17	5.0	133.0	415.0	67	500	R-17
18	52.0	125.0	415.0	67	500	R-18
19	52.0	141.0	415.0	67	500	R-19

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	R-1	67.	500.	63.1
2	R-2	67.	500.	59.4
3	R-3	67.	500.	55.6
4	R-4	67.	500.	48.8
5	R-5	67.	500.	56.3
6	R-6	67.	500.	55.9
7	R-7	67.	500.	58.9
8	R-8	67.	500.	57.1
9	R-9	67.	500.	58.6
10	R-10	67.	500.	58.0
11	R-11	67.	500.	64.0
12	R-12	67.	500.	61.0
13	R-13	67.	500.	61.5
14	R-14	67.	500.	69.1
15	R-15	67.	500.	62.3
16	R-16	67.	500.	63.1
17	R-17	67.	500.	65.6
18	R-18	67.	500.	64.1
19	R-19	67.	500.	66.5

DROP-OFF RATES

ALL LANE/RECEIVER PAIRS = 3.0 DBA

K - CONSTANTS

ALL LANE RECEIVER/PAIRS = 0.0 DBA

APPENDIX B

Exterior-to-Interior Noise Analysis

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: Shellstrom Condominiums
Project # : A51104N1
Room Name: Northeast Corner - Master Bedroom

Wall 1 of 2

Room Type : **Moderate**

	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Reverberation Time (sec) :	1.2	1.2	1.2	1.2	1.0	1.0	: Moderately Reflective Room
Room Absorption (Sabins) :	45	45	45	45	56	56	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**71.1**	**CNEL**	54.4	59.9	62.4	66.4	66.4	60.4	: Traffic Spectrum
Source 2:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		**71.1**	**CNEL**	54.4	59.9	62.4	66.4	66.4	60.4	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
STC 43 Typical Exterior Wall	N	12.5	9	1	94.5	33	39	43	43	41	50
STC 28 1/2-inch Dual Insulating Window	Y	6	3	1	18.0	24	24	24	34	44	41
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Room Depth: **10** ft   **Overall Area:** **112.5** ft²
Volume: **1125** ft³

Number of Impacted Walls: **2**

Windows Open Interior Noise Level:	**56.1**	**CNEL**
Windows Closed Interior Noise Level:	**40.9**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
54.4	59.9	62.4	66.4	66.4	60.4	: Exterior Wall Noise Exposure
10.9	10.9	10.9	11.0	11.0	11.0	: Transmission Loss
0.0	0.0	0.0	0.0	0.0	0.0	: Noise Reduction
16.5	16.5	16.5	16.5	17.5	17.5	: Absorption
37.9	43.4	45.9	49.9	48.9	42.9	: Noise Level

54.2 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
54.4	59.9	62.4	66.4	66.4	60.4	: Exterior Wall Noise Exposure
29.8	31.3	31.7	39.8	41.4	46.8	: Transmission Loss
9.2	10.8	11.2	19.2	20.8	26.2	: Noise Reduction
16.5	16.5	16.5	16.5	17.5	17.5	: Absorption
28.6	32.6	34.7	30.6	28.1	16.7	: Noise Level

38.7 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: Shellstrom Condominiums **Wall 2 of 2**
Project # : A51104N1
Room Name: Northeast Corner - Master Bedroom

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	Traffic	68.5	CNEL	51.8	57.3	59.8	63.8	63.8	57.8	: Traffic Spectrum
Source 2:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		68.5	CNEL	51.8	57.3	59.8	63.8	63.8	57.8	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
STC 43 Typical Exterior Wall	N	12	9	1	84.0	33	39	43	43	41	50
STC 28 1/2-inch Dual Insulating Window	Y	6	4	1	24.0	24	24	24	34	44	41
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Overall Area: **108** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.8	57.3	59.8	63.8	63.8	57.8	: Exterior Wall Noise Exposure
9.5	9.5	9.5	9.5	9.5	9.5	: Transmission Loss
0.0	0.0	0.0	0.0	0.0	0.0	: Noise Reduction
16.5	16.5	16.5	16.5	17.5	17.5	: Absorption
35.3	40.8	43.3	47.3	46.3	40.3	: Noise Level
51.6	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
51.8	57.3	59.8	63.8	63.8	57.8	: Exterior Wall Noise Exposure
28.9	30.1	30.3	38.9	41.5	45.9	: Transmission Loss
8.6	9.7	10.0	18.6	21.2	25.6	: Noise Reduction
16.5	16.5	16.5	16.5	17.5	17.5	: Absorption
26.7	31.0	33.3	28.7	25.1	14.7	: Noise Level
36.9	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: Shellstrom Condominiums **Wall 3 of 2**
Project # : A51104N1
Room Name: Northeast Corner - Master Bedroom

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	Traffic	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	: Traffic Spectrum
Source 2:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		#NUM!	CNEL	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
<N/A>	N	1	1	1	1.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Overall Area: 1 ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	: Exterior Wall Noise Exposure
0.0	0.0	0.0	0.0	0.0	0.0	: Transmission Loss
0.0	0.0	0.0	0.0	0.0	0.0	: Noise Reduction
16.5	16.5	16.5	16.5	17.5	17.5	: Absorption
#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	: Noise Level
#NUM!	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	: Exterior Wall Noise Exposure
0.0	0.0	0.0	0.0	0.0	0.0	: Transmission Loss
0.0	0.0	0.0	0.0	0.0	0.0	: Noise Reduction
16.5	16.5	16.5	16.5	17.5	17.5	: Absorption
#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	: Noise Level
#NUM!	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: Shellstrom Condominiums
Project # : A51104N1
Room Name: East Facade - Bedroom

Wall 1 of 1

Room Type : **Soft**

	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Reverberation Time (sec) :	0.8	0.8	0.8	0.8	0.7	0.7	: Highly Absorptive Room
Room Absorption (Sabins) :	81	81	81	81	101	101	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	Traffic	66.1	CNEL	49.4	54.9	57.4	61.4	61.4	55.4	: Traffic Spectrum
Source 2:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		66.1	CNEL	49.4	54.9	57.4	61.4	61.4	55.4	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
STC 43 Typical Exterior Wall	N	12	9	1	84.0	33	39	43	43	41	50
STC 28 1/2-inch Dual Insulating Window	Y	6	4	1	24.0	24	24	24	34	44	41
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Room Depth: 12.5 ft **Overall Area:** 108 ft²
Volume: 1350 ft³

Number of Impacted Walls: 1

Windows Open		
Interior Noise Level:	**46.6**	**CNEL**
Windows Closed		
Interior Noise Level:	**32.0**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
49.4	54.9	57.4	61.4	61.4	55.4	: Exterior Wall Noise Exposure
9.5	9.5	9.5	9.5	9.5	9.5	: Transmission Loss
0.0	0.0	0.0	0.0	0.0	0.0	: Noise Reduction
19.1	19.1	19.1	19.1	20.1	20.1	: Absorption
30.3	35.8	38.3	42.3	41.4	35.4	: Noise Level

46.6 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
49.4	54.9	57.4	61.4	61.4	55.4	: Exterior Wall Noise Exposure
28.9	30.1	30.3	38.9	41.5	45.9	: Transmission Loss
8.6	9.7	10.0	18.6	21.2	25.6	: Noise Reduction
19.1	19.1	19.1	19.1	20.1	20.1	: Absorption
21.7	26.1	28.3	23.7	20.2	9.7	: Noise Level

32.0 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: Shellstrom Condominiums
Project # : A51104N1
Room Name: East Facade - Bedroom

Wall 2 of 1

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**73.9**	**CNEL**	57.2	62.7	65.2	69.2	69.2	63.2	: Traffic Spectrum
Source 2:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		**73.9**	**CNEL**	57.2	62.7	65.2	69.2	69.2	63.2	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
<N/A>	N	12	11	1	132.0	0	0	0	0	0	0
<N/A>	Y	0	0	1	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Overall Area: **132** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
57.2	62.7	65.2	69.2	69.2	63.2	: Exterior Wall Noise Exposure
0.0	0.0	0.0	0.0	0.0	0.0	: Transmission Loss
0.0	0.0	0.0	0.0	0.0	0.0	: Noise Reduction
19.1	19.1	19.1	19.1	20.1	20.1	: Absorption
38.1	43.6	46.1	50.1	49.2	43.2	: Noise Level
54.4	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
57.2	62.7	65.2	69.2	69.2	63.2	: Exterior Wall Noise Exposure
0.0	0.0	0.0	0.0	0.0	0.0	: Transmission Loss
0.0	0.0	0.0	0.0	0.0	0.0	: Noise Reduction
19.1	19.1	19.1	19.1	20.1	20.1	: Absorption
38.1	43.6	46.1	50.1	49.2	43.2	: Noise Level
54.4	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: Shellstrom Condominiums **Wall 3 of 1**
Project # : A51104N1
Room Name: East Facade - Bedroom

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	Traffic	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	: Traffic Spectrum
Source 2:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		#NUM!	CNEL	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
<N/A>	N	1	1	1	1.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Overall Area: **1** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	: Exterior Wall Noise Exposure
0.0	0.0	0.0	0.0	0.0	0.0	: Transmission Loss
0.0	0.0	0.0	0.0	0.0	0.0	: Noise Reduction
19.1	19.1	19.1	19.1	20.1	20.1	: Absorption
#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	: Noise Level
#NUM!	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	: Exterior Wall Noise Exposure
0.0	0.0	0.0	0.0	0.0	0.0	: Transmission Loss
0.0	0.0	0.0	0.0	0.0	0.0	: Noise Reduction
19.1	19.1	19.1	19.1	20.1	20.1	: Absorption
#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	: Noise Level
#NUM!	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: Shellstrom Condominiums
Project # : A51104N1
Room Name: West Facade - Living Room

Wall 1 of 1

Room Type : **Moderate**

	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Reverberation Time (sec) :	1.2	1.2	1.2	1.2	1.0	1.0	: Moderately Reflective Room
Room Absorption (Sabins) :	117	117	117	117	146	146	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	**Traffic**	**64.3**	**CNEL**	47.6	53.1	55.6	59.6	59.6	53.6	: Traffic Spectrum
Source 2:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	**<N/A>**	**0.0**	**CNEL**	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		**64.3**	**CNEL**	47.6	53.1	55.6	59.6	59.6	53.6	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
STC 43 Typical Exterior Wall	N	20.9	9	1	164.3	33	39	43	43	41	50
STC 28 1/2-inch Dual Insulating Window	Y	6	4	1	24.0	24	24	24	34	44	41
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Room Depth: **15.5** ft
Overall Area: **188.25** ft²
Volume: **2918** ft³

Number of Impacted Walls: **1**

Windows Open Interior Noise Level:	**43.2**	**CNEL**
Windows Closed Interior Noise Level:	**29.3**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
47.6	53.1	55.6	59.6	59.6	53.6	: Exterior Wall Noise Exposure
11.9	11.9	11.9	12.0	12.0	12.0	: Transmission Loss
0.0	0.0	0.0	0.0	0.0	0.0	: Noise Reduction
20.7	20.7	20.7	20.7	21.6	21.6	: Absorption
26.9	32.4	34.9	38.9	38.0	32.0	: Noise Level
43.2	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
47.6	53.1	55.6	59.6	59.6	53.6	: Exterior Wall Noise Exposure
30.2	32.1	32.6	40.2	41.3	47.2	: Transmission Loss
7.5	9.3	9.8	17.5	18.5	24.5	: Noise Reduction
20.7	20.7	20.7	20.7	21.6	21.6	: Absorption
19.4	23.1	25.1	21.4	19.4	7.5	: Noise Level
29.3	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: Shellstrom Condominiums **Wall 2 of 1**
Project # : A51104N1
Room Name: West Facade - Living Room

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	Traffic	73.9	CNEL	57.2	62.7	65.2	69.2	69.2	63.2	: Traffic Spectrum
Source 2:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		73.9	CNEL	57.2	62.7	65.2	69.2	69.2	63.2	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
<N/A>	N	12	11	1	132.0	0	0	0	0	0	0
<N/A>	Y	0	0	1	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Overall Area: **132** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
57.2	62.7	65.2	69.2	69.2	63.2	: Exterior Wall Noise Exposure
0.0	0.0	0.0	0.0	0.0	0.0	: Transmission Loss
0.0	0.0	0.0	0.0	0.0	0.0	: Noise Reduction
20.7	20.7	20.7	20.7	21.6	21.6	: Absorption
36.5	42.0	44.5	48.5	47.6	41.6	: Noise Level
52.8	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
57.2	62.7	65.2	69.2	69.2	63.2	: Exterior Wall Noise Exposure
0.0	0.0	0.0	0.0	0.0	0.0	: Transmission Loss
0.0	0.0	0.0	0.0	0.0	0.0	: Noise Reduction
20.7	20.7	20.7	20.7	21.6	21.6	: Absorption
36.5	42.0	44.5	48.5	47.6	41.6	: Noise Level
52.8	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: Shellstrom Condominiums **Wall 3 of 1**
Project # : A51104N1
Room Name: West Facade - Living Room

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	Traffic	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	: Traffic Spectrum
Source 2:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		#NUM!	CNEL	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
<N/A>	N	1	1	1	1.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Overall Area: **1** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	: Exterior Wall Noise Exposure
0.0	0.0	0.0	0.0	0.0	0.0	: Transmission Loss
0.0	0.0	0.0	0.0	0.0	0.0	: Noise Reduction
20.7	20.7	20.7	20.7	21.6	21.6	: Absorption
#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	: Noise Level
#NUM!	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	: Exterior Wall Noise Exposure
0.0	0.0	0.0	0.0	0.0	0.0	: Transmission Loss
0.0	0.0	0.0	0.0	0.0	0.0	: Noise Reduction
20.7	20.7	20.7	20.7	21.6	21.6	: Absorption
#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	: Noise Level
#NUM!	**CNEL**	WINDOWS CLOSED				

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: Shellstrom Condominiums
Project # : A51104N1
Room Name: Northwest Corner - Bedroom

Wall 1 of 2

Room Type : Soft

	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Reverberation Time (sec) :	0.8	0.8	0.8	0.8	0.7	0.7	: Highly Absorptive Room
Room Absorption (Sabins) :	55	55	55	55	69	69	

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	Traffic	62.2	CNEL	45.5	51.0	53.5	57.5	57.5	51.5	: Traffic Spectrum
Source 2:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		62.2	CNEL	45.5	51.0	53.5	57.5	57.5	51.5	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
STC 43 Typical Exterior Wall	N	9.7	9	1	67.4	33	39	43	43	41	50
STC 28 1/2-inch Dual Insulating Window	Y	5	4	1	20.0	24	24	24	34	44	41
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Room Depth: 10.6 ft

Overall Area: 87.375 ft²
Volume: 925 ft³

Number of Impacted Walls: 2

Windows Open Interior Noise Level:	**56.3**	**CNEL**
Windows Closed Interior Noise Level:	**40.1**	**CNEL**

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
45.5	51.0	53.5	57.5	57.5	51.5	: Exterior Wall Noise Exposure
9.4	9.4	9.4	9.4	9.4	9.4	: Transmission Loss
0.0	0.0	0.0	0.0	0.0	0.0	: Noise Reduction
17.4	17.4	17.4	17.4	18.4	18.4	: Absorption
28.1	33.6	36.1	40.1	39.1	33.1	: Noise Level

44.4 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
45.5	51.0	53.5	57.5	57.5	51.5	: Exterior Wall Noise Exposure
28.9	30.0	30.2	38.9	41.5	45.9	: Transmission Loss
9.5	10.6	10.8	19.5	22.1	26.5	: Noise Reduction
17.4	17.4	17.4	17.4	18.4	18.4	: Absorption
18.6	23.0	25.3	20.6	17.0	6.6	: Noise Level

28.9 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: Shellstrom Condominiums
Project # : A51104N1
Room Name: Northwest Corner - Bedroom

Wall 2 of 2

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	Traffic	73.9	CNEL	57.2	62.7	65.2	69.2	69.2	63.2	: Traffic Spectrum
Source 2:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		73.9	CNEL	57.2	62.7	65.2	69.2	69.2	63.2	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
STC 43 Typical Exterior Wall	N	10.6	9	1	80.3	33	39	43	43	41	50
STC 28 1/2-inch Dual Insulating Window	Y	5	3	1	15.0	24	24	24	34	44	41
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Overall Area: 95.25 ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
57.2	62.7	65.2	69.2	69.2	63.2	: Exterior Wall Noise Exposure
11.0	11.0	11.0	11.0	11.0	11.0	: Transmission Loss
0.0	0.0	0.0	0.0	0.0	0.0	: Noise Reduction
17.4	17.4	17.4	17.4	18.4	18.4	: Absorption
39.8	45.3	47.8	51.8	50.8	44.8	: Noise Level

56.1 **CNEL** WINDOWS OPEN

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
57.2	62.7	65.2	69.2	69.2	63.2	: Exterior Wall Noise Exposure
29.8	31.3	31.7	39.8	41.4	46.8	: Transmission Loss
10.0	11.6	12.0	20.0	21.6	27.0	: Noise Reduction
17.4	17.4	17.4	17.4	18.4	18.4	: Absorption
29.8	33.7	35.8	31.8	29.2	17.8	: Noise Level

39.8 **CNEL** WINDOWS CLOSED

EXTERIOR TO INTERIOR NOISE REDUCTION ANALYSIS

Project Name: Shellstrom Condominiums **Wall 3 of 2**
Project # : A51104N1
Room Name: Northwest Corner - Bedroom

		Noise Level		125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
Source 1:	Traffic	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	: Traffic Spectrum
Source 2:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Source 3:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Source 4:	<N/A>	0.0	CNEL	0.0	0.0	0.0	0.0	0.0	0.0	
Overall:		#NUM!	CNEL	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	: Effective Noise Spectrum

Assembly Type	Open	Width	Height	Qty	Total Area	125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz
<N/A>	N	1	1	1	1.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0
<N/A>	N	0	0	0	0.0	0	0	0	0	0	0

Overall Area: **1** ft²

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	: Exterior Wall Noise Exposure
0.0	0.0	0.0	0.0	0.0	0.0	: Transmission Loss
0.0	0.0	0.0	0.0	0.0	0.0	: Noise Reduction
17.4	17.4	17.4	17.4	18.4	18.4	: Absorption
#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	: Noise Level
#NUM!	**CNEL**	WINDOWS OPEN				

125 Hz	250 Hz	500 Hz	1KHz	2KHz	4KHz	
#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	: Exterior Wall Noise Exposure
0.0	0.0	0.0	0.0	0.0	0.0	: Transmission Loss
0.0	0.0	0.0	0.0	0.0	0.0	: Noise Reduction
17.4	17.4	17.4	17.4	18.4	18.4	: Absorption
#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	: Noise Level
#NUM!	**CNEL**	WINDOWS CLOSED				

APPENDIX C

Sound Insulation Prediction Results

Sound Insulation Prediction (v6.0)

Margin of error is generally within +/- 3STC

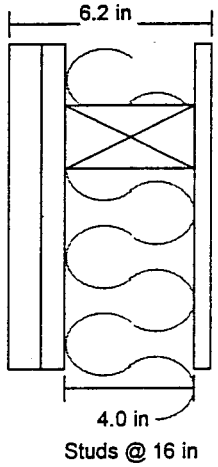
JobName: Notes:

Job No.: Page No:

Date: 13 Jan 06 Initials:

File name:58ply.ins

1 x 1.0 in Stucco on 1/2" type X gypsum bacl1 x 0.5 in Gypsum Board
1 x 0.7 in Plywood



Studs @ 16 in

STC 43
C 0
Ctr 0

Surf. mass 6.9 lb/ft2
Surf. mass 2.0 lb/ft2
Crit. freq 832 Hz
Crit. freq 1326 Hz fo =73 Hz
damping 0.01
Panel damping 0.01

Surf. mass 1.6 lb/ft2
Crit. freq 3038 Hz
damping 0.01
infill fiberglass (0.6 lb/ft3) thickness 4 in

Frequency (Hz)	TL(dB)	TL(dB)
50	22	
63	21	22
80	23	
100	29	
125	33	32
160	36	
200	39	
250	41	40
315	42	
400	43	
500	45	44
630	44	
800	40	
1000	38	39
1250	41	
1600	44	
2000	46	46
2500	48	
3150	50	
4000	54	53
5000	57	

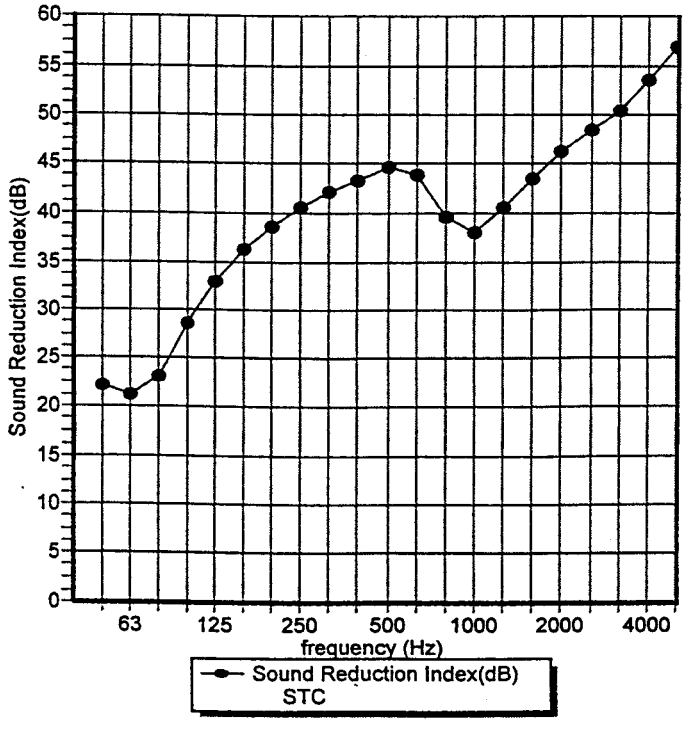


Table 3.1b Glass Sound Transmission Loss Data*

Glass Configuration

Insulating

Sound Transmission Loss (dB)

One-third octave band (Hz)	100	125	160	200	250	315	400	500	630	800	1,000	1,250	1,600	2,000	2,500	3,150	4,000	5,000	STC	OITC	R_w
1/8" - 1/4" AS" - 1/8" (SEALED) RAL-TL85-212	26	21	23	23	26	21	19	24	27	30	33	36	40	44	46	39	34	45	28	26	30 10 dB @ 400 Hz
1/8" - 3/8" AS" - 1/8" (SEALED) RAL-TL85-213	26	23	23	20	23	19	23	27	29	32	35	39	44	47	48	41	36	43	31	26	32 9 dB @ 315 Hz
1/4" - 1/2" AS" - 1/4" (SEALED) RAL-TL85-294	29	22	26	18	25	25	31	32	34	36	39	40	39	35	36	46	52	58	35	28	35
3/16" - 1" AS" - 3/16" (SEALED) RAL-TL85-215	20	25	18	17	26	28	33	36	38	39	41	44	46	43	38	40	48	51	35	27	37 10 dB @ 200 Hz
1/4" - 1" AS" - 1/4" (UNSEALED) RAL-TL85-293	22	19	27	23	31	30	35	35	36	39	41	42	41	36	37	46	51	56	37	30	37
3/16" - 4" AS" - 3/16" (UNSEALED) RAL-TL85-216	24	28	30	33	30	38	38	44	46	50	50	50	51	49	41	42	50	52	44	35	44

*The data and information set forth are based on samples tested and are not guaranteed for all samples or applications. Riverbank Acoustical Laboratories.
**Air space.

APPENDIX D

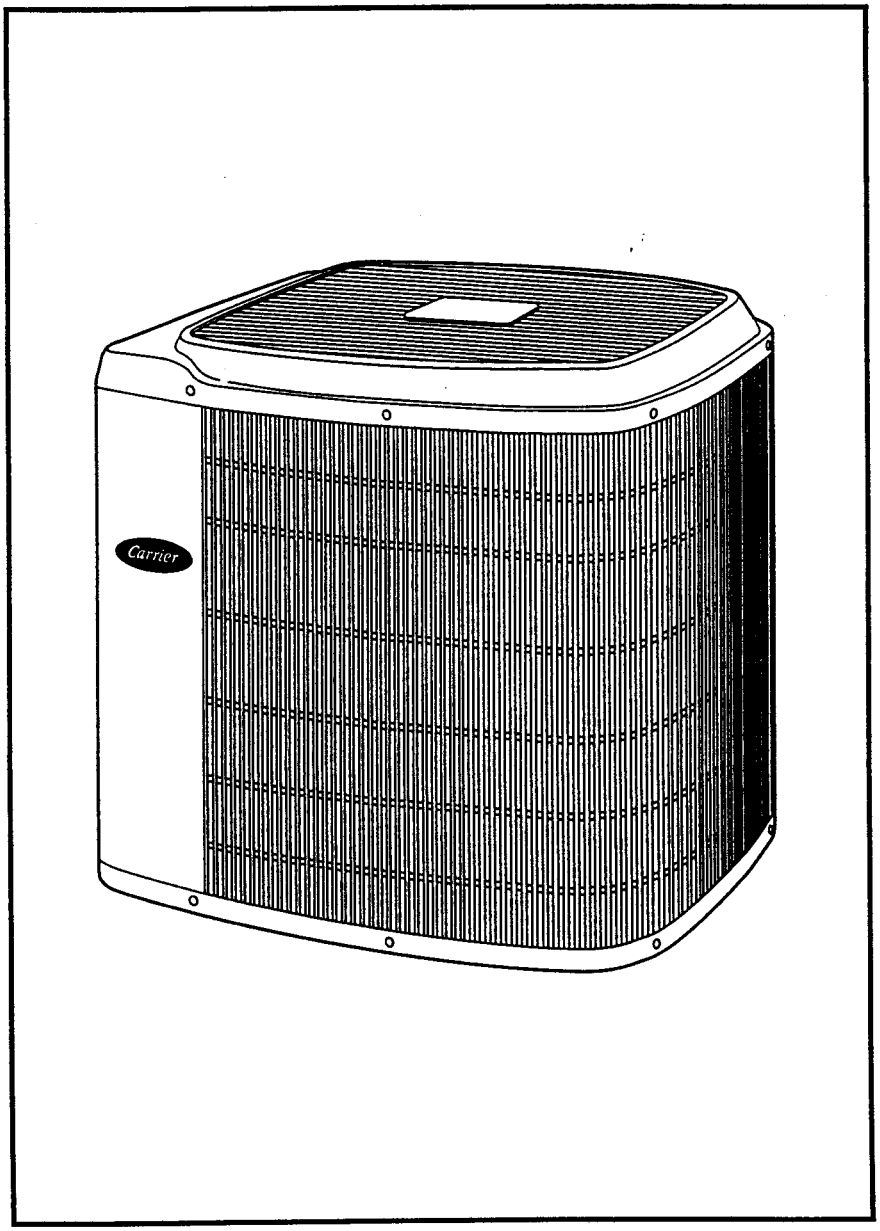
Manufacturer's Noise Data

Carrier
HEATING & COOLING

Product Data

38TUA (60 Hz) Air Conditioner

Sizes 018 thru 060



Model 38TUA Energy-Efficient Air Conditioner incorporates innovative technology to provide quiet, reliable summer cooling performance. Built into these units are the features most desired by homeowners today, including SEER ratings of up to 12.0 when used with components as designated by manufacturer. All models are listed with UL, cUL, ARI, CEC, and CSA-EEV.

The Tech 2000 Silencer System features the Silencer Top design, energy-efficient fan and motor, advanced sound hood, and compressor vibration isolator plate.

The Silencer Top for improved airflow pattern requiring less energy.

Energy-Efficient Fan and Fan Motor adds to quiet operation while moving air more efficiently.

Sound Hood to muffle noise from operation.

Compressor Vibration Isolator Plate eliminates compressor vibration transmission to the base pan thus ensuring quiet operation.

AVAILABLE OPTIONS

Electrical Range — Units are offered in 208/230 volts, single phase.

Wide Range of Sizes — Available in 7 nominal sizes from 018 through 060 to meet the needs of residential and light commercial applications.

WeatherArmor™ III System — The casing steel is galvanized and coated with a layer of zinc phosphate. A modified polyester powder coating is then applied and baked on, providing each unit with a hard, smooth finish that will last for many years.

Electrical data

UNIT SIZE / SERIES	V/PH	OPER VOLTS*		COMPR		FAN FLA	MCA	60°C MIN WIRE SIZE†	75°C MIN WIRE SIZE†	MAX LENGTH (FT) 60°/75°C‡	MAX LENGTH (m) 60°/75°C‡	MAX FUSE** OR CKT BKR AMPS
		Max	Min	LRA	RLA							
024-074	230-1	253	207	72.5	15.0	0.6	19.4	14	14	39/37	9.9/9.4	30
036-094	400-3	440	360	49.5	8.2	0.7	10.9	14	14	165/157	41.9/39.9	15
048-094				63.0	7.9	0.7	10.7	14	14	165/157	41.9/39.9	15
060-094				74.0	9.0	0.7	11.9	14	14	152/144	38.6/36.5	20

* Permissible limits of the voltage range at which the unit will operate satisfactorily. Operation outside these limits may result in unit failure. If wire is applied at ambient greater than 30°C (86°F), consult Table 310-16 of the NEC (ANSI/NFPA 70).
The ampacity of nonmetallic-sheathed cable (NM), trade name ROMEX, shall be that of 60°C (140°F) conductors, per the NEC (ANSI/NFPA 70) Article 336-26.
All motors/compressors contain internal overload protection.
† American wire gage.
‡ Length shown is as measured 1 way along wire path between unit and service panel for a voltage drop not to exceed 2%.
** Time-delay fuse.

FLA — Full Load Amps
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
RLA — Rated Load Amps

Performance summary

UNIT SIZE	INDOOR MODEL	NOMINAL AIRFLOW		COOLING CAP @ 95°F (35°C)				COOLING CAP 115°F (46°C)		
				Rated Capacity		Power	Rated	Rated Capacity		Power
		CFM	L/S	BTUH	KW	KW	EER	BTUH	KW	KW
024-074	F(A,B)4ASF024*	800	380	23,000	6.7	2.34	10.30	20,700	6.1	2.87
	F(A,B)4ASF030	800	380	24,000	7.0	2.33	10.40	21,031	6.2	2.86
	FG3ASA024	800	380	23,000	6.7	2.40	9.70	20,023	5.9	2.95
036-094	F(A,B)4ASF036*	1200	560	35,000	10.3	3.76	10.40	31,600	9.3	4.56
	F(A,B)4AS(F,B)042	1200	560	36,000	10.5	3.71	10.50	32,320	9.5	4.50
	FG3ASA036	1200	560	35,000	10.3	3.69	9.80	29,395	8.6	4.48
048-094	F(A,B)4AS(F,B)048*	1600	750	47,000	13.8	5.12	9.50	42,400	12.4	6.20
	F(A,B)4AS(F,B)060	1600	750	48,000	14.1	5.26	9.50	43,540	12.8	6.37
	FG3ASA048	1600	750	46,000	13.5	5.20	9.10	41,100	12.0	6.30
	FG3ASA060	1600	750	47,000	13.8	5.25	9.20	42,179	12.4	6.35
060-094	F(A,B)4AS(F,B)060*	1850	950	57,500	16.8	6.03	9.50	52,100	15.3	7.26
	FB4ASB070	1850	950	59,000	17.3	6.14	9.50	53,364	15.6	7.39
	FG3ASA060	1850	950	56,500	16.6	6.00	9.40	51,286	15.0	7.23

* Tested Combination

NOTES:

1. Ratings are net values reflecting the effects of circulating fan motor heat. Supplemental electric heat is not included.
2. Tested outdoor/indoor combinations have been tested in accordance with DOE test procedures for central air conditioners. Ratings for other combinations are determined under DOE computer simulation procedures.
3. Determine actual CFM values obtainable for your system by referring to fan performance data in fan coil or furnace coil literature.

Sound power (dBA)

UNIT SIZE	SOUND RATING (dBA)	A-WEIGHTED SOUND POWER LEVELS WITHIN OCTAVE BAND SHOWN (Hz)						
		125	250	500	1000	2000	4000	8000
024	72	53.5	63.0	65.0	67.0	63.5	59.0	50.5
036	74	58.0	64.0	67.5	67.0	66.0	64.5	59.0
048	75	55.5	63.0	66.5	68.0	68.0	65.0	59.5
060	75	55.5	64.0	69.0	67.0	67.5	65.5	60.0

APPENDIX E

Cadna Data and Analysis

A71006N1 Shellstrom Condos - AC Noise Sources

Name	M.	ID	Result. PWL		Lw / Li			Correction		Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day	Night	Type	Value	norm.	Day	Night	R	Area		Day	Special	Night						X	Y	Z
			(dBA)	(dBA)			dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		(m)		(m)	(m)	(m)
AC Unit			72.4	72.4	Lw	tua		0.0	0.0							0.0		(none)	1.00	r	111.26	153.23	1.00
AC Unit			72.4	72.4	Lw	tua		0.0	0.0							0.0		(none)	1.00	r	111.29	141.85	1.00
AC Unit			72.4	72.4	Lw	tua		0.0	0.0							0.0		(none)	1.00	r	111.28	135.16	1.00
AC Unit			72.4	72.4	Lw	tua		0.0	0.0							0.0		(none)	1.00	r	111.29	141.10	1.00

A71006N1 Shellstrom Condos - Table of Noise Emission Data - Page 1

Name	ID	Type	Oktave Spectrum (dB)												Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
Sheet Metal Forming (Grinding, Hammer)	L01	Li				85	90	100	100	100	95		105.1	105.4	VDI 2571
Sheet Metal Forming (Fabrication Shop/Pressroom Thin Sheet)	L02	Li				80	85	90	80	85	80		90.7	92.9	VDI 2571
Wire Rolling Mill (big Hall)	L03	Li				75	80	85	80	75	70		85.1	87.7	VDI 2571
Wire Rolling Mill (Drawing Shop)	L04	Li				85	90	90	85	80	75		90.5	94.4	VDI 2571
Wire Rolling Mill (Roller Levelling)	L05	Li				90	95	95	90	90	90		97.4	100.1	VDI 2571
Printing Plant (Rotary/Web-fed Printing Machine)	L06	Li				90	90	95	90	85	75		95	98.1	VDI 2571
Printing Plant (small)	L07	Li				75	80	80	80	75	70		83.4	85.7	VDI 2571
Extruder	L08	Li				80	95	80	80	75	70		88.1	95.4	VDI 2571
Beverage facility	L09	Li				80	80	85	90	90	85		94.6	94.5	VDI 2571
Rubber Kneader/Banbury mixer (2 Machines)	L10	Li				95	95	90	85	80	75		91.7	98.9	VDI 2571
Casting Cleaning Room/Dressing Room	L11	Li				85	90	90	90	85	85		93.9	96	VDI 2571
Power Plant (Machine Station)	L12	Li				90	85	85	85	85	85		91.3	94.1	VDI 2571
Power Plant (Boiler Station with Coal Mill)	L13	Li				80	80	85	85	85	70		89.6	90.6	VDI 2571
Mills (Tube Mill)	L14	Li				90	95	100	100	100	95		105.1	105.7	VDI 2571
Mills (Spring Power Mill)	L15	Li				95	95	90	85	80	75		91.7	98.9	VDI 2571
Mills (Impact Crusher for Plastic)	L16	Li				90	95	100	105	95	95		106.5	107.2	VDI 2571
Test Bench Diesel Motor without Absorption	L17	Li				105	105	105	100	100	95		106.8	110.7	VDI 2571
Test Bench Diesel Motor with Absorption	L18	Li				95	95	95	90	90	85		96.8	100.7	VDI 2571
Tube Factory	L19	Li				75	75	80	85	90	90		94.7	93.9	VDI 2571
Jolting/Vibrating Tables for Precast Concrete parts	L20	Li				100	100	100	95	90	85		100.5	105.4	VDI 2571
Smelting hall/Foundry with Shake out	L21	Li				90	95	95	90	90	90		97.4	100.1	VDI 2571
Joiner's Workshop	L22	Li				85	95	95	90	90	85		96.7	99.5	VDI 2571
Joiner's Workshop (Wood Chip, Wood Splitter Maschine)	L23	Li				95	95	100	95	95	95		102.2	104.1	VDI 2571
Automatic Bar Turnery	L24	Li				80	85	90	85	90	85		94.1	94.8	VDI 2571
Tablet Production (Compressing)	L25	Li				75	80	85	85	80	75		88.2	89.5	VDI 2571
Textile Production (Spinning Machine)	L26	Li				85	85	90	85	85	80		91.4	93.7	VDI 2571
Textile Production (Preparatory box)	L27	Li				80	80	80	80	80	75		85.3	87.3	VDI 2571
Textile Production (Ring Twister frame)	L28	Li				85	85	85	90	85	80		92.4	93.7	VDI 2571
Textile Production (Double-Twist frame)	L29	Li				95	95	95	95	95	95		101.3	102.8	VDI 2571
Textile Production (False Twisting Machine)	L30	Li				80	80	85	90	90	90		95.7	95.5	VDI 2571
Packaging Machine	L31	Li				80	80	80	80	75	70		83.4	86.5	VDI 2571
Loomery	L32	Li				85	85	90	95	95	90		99.6	99.5	VDI 2571
Tool Grinding Shop	L33	Li				85	85	90	85	80	75		90.1	93.2	VDI 2571
WhisperWatt	Lp	Lw (c)		76.2	101	85.1	76.9	78.7	71	72.3	67.5	60.2	80.9	101.2	MQ Power
Marvair ComPAC II	IB02	Lw (c)		14.5	94.4	92	92	85	85.1	81.3	74.1	69.7	89.8	98.3	
Four Verizon Cabinets	VZW	Lw (c)		20.7	77.8	73	83.3	75	73.8	70.4	63.5	59.6	79.4	85.6	CT Meas
WhisperWatt 25	IB01	Lw (c)		76.2	101	85.1	76.9	78.7	71	72.3	67.5	60.2	80.9	101.2	MQ Power
Cingular RBS 2102	RBS	Lw (c)		14.5	70.9	71.2	74.6	61.6	51.8	48.6	47.2	47.9	67.3	77.5	CT Meas
MQ - 20I for Verizon	MQ20	Lw (c)		27.9	27.9	97.9	95.9	94.9	86.9	80.9	76.9	27.9	94.6	101.4	Jim Rose MQ Power (Misc Noise Info Folder)
Carrier 38BRC060	CBRC	Lw		0	0	58	65	69.5	75.5	74	71.5	65	79.7	79.6	Carrier Website
Existing Sun AC Unit	Sun	Lw (c)		75.5	76.3	63.1	64.1	66.1	65.4	78.2	90.4	74.3	91.7	91.1	IRB Meas
Marvair Compac I	ComPI	Lw (c)	A	33.8	40.2	59.6	74.1	86.2	87.6	86.5	84.7	64.8	92.4	93.5	IRB Meas
Kohler Generator	REO60	Lw (c)		27.9	27.9	27.9	27.9	103.9	27.9	27.9	27.9	27.9	100.7	103.9	Kohler Pubs
Carrier 38HDC060	chdc	Lw	A	0	0	54.9	59.8	63.6	64.5	63.9	60.1	50.3	70	74.8	Manufacturer's noise data
Carrier 38YZA36	yza	Li		0	0	50	56	61	67	60	54	46.5	68.7	69.1	web
Carrier 38YZA42	yza42	Li		0	0	54.5	61.5	64	61.5	59.5	55.5	47	66.5	68.4	web
Carrier 48 HDJ014	hdj	Li		0	63.7	69.9	72.5	78.2	81.1	77.3	73.3	66.8	84.2	84.8	web
Carrier 38YXA060	yxa	Li		0	0	59	67.5	69	70	67.5	65	59	74.3	75.3	web
Garage Exhaust Fan 1A	gef	Li		0	78	89	77	78	78	72	64	0	81.6	90.2	TAP

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Cingular RBS 2102	RBS2102	Lw (c)		14.5	70.9	71.2	74.6	61.6	51.8	48.6	47.2	47.9	67.3	77.5	CT Meas
RBS 2106	*RBS2106*	*Lw (c)*		*14.5*	*78.9*	*75.7*	*69.8*	*61.5*	*60.4*	*56.7*	*58.5*	*49.1*	*67.6*	*81.1*	*CT Meas*
Playground Noise	jrm	Lw (c)		88.9	92.8	88.2	78.6	79.3	86.9	88.5	82.5	70.2	92.4	96.9	Jess Ras Meas 1
Modcel 4.0 and Battery Cabinet	mod4	Lw (c)		10.3	79.2	77.3	81.6	78.9	72.1	67	59.1	54.8	79.1	85.8	Measured from CT
Carrier 38HDL-60	hdl38	Lw	A	0	0	60.9	55.9	60.3	61.5	59.2	57	47.9	67.4	77.6	Website
Carrier 38TUC-060	tua	Lw	A	0	0	59.5	73	70	68	66.5	65.5	60	76.6	83.3	Carrier Website
Carrier 38TUA-36	tua	Lw		0	0	58	64	67.5	67	66	64.5	59	72.4	73.3	carrier.com
Verizon Generator Vent	vervent	Lw		0	0	83	81	81	73	66	63	0	80.4	86.8	TAP
ATT Cabinets	A	Li		80.4	83.9	85.7	76.9	75.4	82.2	81.1	76.9	76	86.6	90.8	
Cricket CMO Cabinet	L1	Lw (c)		14.6	75.9	68.8	69.6	73.7	71.4	69.2	63.1	52.8	76.1	80.2	
Ericsson RBS 2106 Cabinet	L2	Lw (c)		14.6	79	75.8	69.9	61.6	60.5	56.8	58.6	49.2	67.7	81.2	
Sprint Equipment at Vent	L3	Lw		0	59.4	60.4	69.6	68.5	61.1	57.9	50.5	43.3	68.4	73.1	
Nextel Carrier HVAC Units	L4	Lw		0	79.7	86	82	81.6	81.5	79.8	74.8	69.1	86.2	90.3	
Ericsson RBS 2102 Cabinet	L5	Lw (c)		14.6	71	71.3	74.7	61.7	51.9	48.7	47.3	48	67.4	77.6	
Cricket PPC Cabinet	ppc	Lw (c)		62.1	67.4	64.6	67.2	67.2	56.5	45.9	34.6	20.2	65.8	73.2	irb Meas
HVAC unit Bonita Highland	Bayrd	Lw (c)		16.6	16.6	16.6	16.6	91	16.6	16.6	16.6	16.6	87.8	91	IRB Meas
Bard HVAC Unit	bard	Lw (c)		14.6	14.6	14.6	14.6	84.6	14.6	14.6	14.6	14.6	81.4	84.6	Misc Noise Info Manufacturer's
Four Verizon Cabinets - Back	VZWb	Lw (c)		20.7	77.8	73	83.3	75	73.8	70.4	63.5	59.6	79.4	85.6	CT Meas
Four Verizon Cabinets - Front	vzwf	Lw (c)		20.7	75	77.5	80.1	73.9	71.9	71.8	66.4	61	78.4	84	CT Meas
Sprint Flex Cabinet	sprt	Lw (c)		10.2	79.1	77.2	81.5	78.8	72	66.9	59	54.7	79	85.7	CT misc noise meas
Generac Generator	gen	Lw (c)	A	47.6	84.5	85.6	90.9	91.7	88.2	89.1	85.2	77.5	97.2	111.6	
McLean AWP T29 HVAC Unit	awp	Lw (c)		14.6	14.6	14.6	14.6	83.6	14.6	14.6	14.6	14.6	80.4	83.6	McLean
Sun HVAC Unit	sun1	Lw (c)		72	84.6	88.3	88	85.5	78.7	75.6	70.8	63.3	86.1	93.2	IRB meas A60317
Genrac Power Systems	gen30	Lw (c)		27.9	101.7	86.8	89.6	90.8	90.3	85.1	81	77.9	93.9	102.8	

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Name	ID	Type	Oktave Spectrum (dB)												Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
Sheet Metal Forming (Grinding, Hammer)	L01	Li				85	90	100	100	100	95		105.1	105.4	VDI 2571
Sheet Metal Forming (Fabrication Shop/Pressroom Thin Sheet)	L02	Li				80	85	90	80	85	80		90.7	92.9	VDI 2571
Wire Rolling Mill (big Hall)	L03	Li				75	80	85	80	75	70		85.1	87.7	VDI 2571
Wire Rolling Mill (Drawing Shop)	L04	Li				85	90	90	85	80	75		90.5	94.4	VDI 2571
Wire Rolling Mill (Roller Levelling)	L05	Li				90	95	95	90	90	90		97.4	100.1	VDI 2571
Printing Plant (Rotary/Web-fed Printing Machine)	L06	Li				90	90	95	90	85	75		95	98.1	VDI 2571
Printing Plant (small)	L07	Li				75	80	80	80	75	70		83.4	85.7	VDI 2571
Extruder	L08	Li				80	95	80	80	75	70		88.1	95.4	VDI 2571
Beverage facility	L09	Li				80	80	85	90	90	85		94.6	94.5	VDI 2571
Rubber Kneader/Banbury mixer (2 Machines)	L10	Li				95	95	90	85	80	75		91.7	98.9	VDI 2571
Casting Cleaning Room/Dressing Room	L11	Li				85	90	90	90	85	85		93.9	96	VDI 2571
Power Plant (Machine Station)	L12	Li				90	85	85	85	85	85		91.3	94.1	VDI 2571
Power Plant (Boiler Station with Coal Mill)	L13	Li				80	80	85	85	85	70		89.6	90.6	VDI 2571
Mills (Tube Mill)	L14	Li				90	95	100	100	100	95		105.1	105.7	VDI 2571
Mills (Spring Power Mill)	L15	Li				95	95	90	85	80	75		91.7	98.9	VDI 2571
Mills (Impact Crusher for Plastic)	L16	Li				90	95	100	105	95	95		106.5	107.2	VDI 2571
Test Bench Diesel Motor without Absorption	L17	Li				105	105	105	100	100	95		106.8	110.7	VDI 2571
Test Bench Diesel Motor with Absorption	L18	Li				95	95	95	90	90	85		96.8	100.7	VDI 2571
Tube Factory	L19	Li				75	75	80	85	90	90		94.7	93.9	VDI 2571
Jolting/Vibrating Tables for Precast Concrete parts	L20	Li				100	100	100	95	90	85		100.5	105.4	VDI 2571
Smelting hall/Foundry with Shake out	L21	Li				90	95	95	90	90	90		97.4	100.1	VDI 2571
Joiner's Workshop	L22	Li				85	95	95	90	90	85		96.7	99.5	VDI 2571
Joiner's Workshop (Wood Chip, Wood Splitter Maschine)	L23	Li				95	95	100	95	95	95		102.2	104.1	VDI 2571
Automatic Bar Turnery	L24	Li				80	85	90	85	90	85		94.1	94.8	VDI 2571
Tablet Production (Compressing)	L25	Li				75	80	85	85	80	75		88.2	89.5	VDI 2571
Textile Production (Spinning Machine)	L26	Li				85	85	90	85	85	80		91.4	93.7	VDI 2571
Textile Production (Preparatory box)	L27	Li				80	80	80	80	80	75		85.3	87.3	VDI 2571
Textile Production (Ring Twister frame)	L28	Li				85	85	85	90	85	80		92.4	93.7	VDI 2571
Textile Production (Double-Twist frame)	L29	Li				95	95	95	95	95	95		101.3	102.8	VDI 2571
Textile Production (False Twisting Machine)	L30	Li				80	80	85	90	90	90		95.7	95.5	VDI 2571
Packaging Machine	L31	Li				80	80	80	80	75	70		83.4	86.5	VDI 2571
Loomery	L32	Li				85	85	90	95	95	90		99.6	99.5	VDI 2571
Tool Grinding Shop	L33	Li				85	85	90	85	80	75		90.1	93.2	VDI 2571
WhisperWatt	Lp	Lw (c)		76.2	101	85.1	76.9	78.7	71	72.3	67.5	60.2	80.9	101.2	MQ Power
Marvair ComPAC II	IB02	Lw (c)		14.5	94.4	92	92	85	85.1	81.3	74.1	69.7	89.8	98.3	
Four Verizon Cabinets	VZW	Lw (c)		20.7	77.8	73	83.3	75	73.8	70.4	63.5	59.6	79.4	85.6	CT Meas
WhisperWatt 25	IB01	Lw (c)		76.2	101	85.1	76.9	78.7	71	72.3	67.5	60.2	80.9	101.2	MQ Power
Cingular RBS 2102	RBS	Lw (c)		14.5	70.9	71.2	74.6	61.6	51.8	48.6	47.2	47.9	67.3	77.5	CT Meas
MQ - 20I for Verizon	MQ20	Lw (c)		27.9	27.9	97.9	95.9	94.9	86.9	80.9	76.9	27.9	94.6	101.4	Jim Rose MQ Power (Misc Noise Info Folder)
Carrier 38BRC060	CBRC	Lw		0	0	58	65	69.5	75.5	74	71.5	65	79.7	79.6	Carrier Website
Existing Sun AC Unit	Sun	Lw (c)		75.5	76.3	63.1	64.1	66.1	65.4	78.2	90.4	74.3	91.7	91.1	IRB Meas
Marvair Compac I	ComPI	Lw (c)	A	33.8	40.2	59.6	74.1	86.2	87.6	86.5	84.7	64.8	92.4	93.5	IRB Meas
Kohler Generator	REO60	Lw (c)		27.9	27.9	27.9	27.9	103.9	27.9	27.9	27.9	27.9	100.7	103.9	Kohler Pubs
Carrier 38HDC060	chdc	Lw	A	0	0	54.9	59.8	63.6	64.5	63.9	60.1	50.3	70	74.8	Manufacturer's noise data
Carrier 38YZA36	yza	Li		0	0	50	56	61	67	60	54	46.5	68.7	69.1	web
Carrier 38YZA42	yza42	Li		0	0	54.5	61.5	64	61.5	59.5	55.5	47	66.5	68.4	web
Carrier 48 HDJ014	hdj	Li		0	63.7	69.9	72.5	78.2	81.1	77.3	73.3	66.8	84.2	84.8	web
Carrier 38YXA060	yxa	Li		0	0	59	67.5	69	70	67.5	65	59	74.3	75.3	web
Garage Exhaust Fan 1A	gef	Li		0	78	89	77	78	78	72	64	0	81.6	90.2	TAP

A71006N1 Shellstrom Condos - Table of Noise Emission Data - Page 2

Cingular RBS 2102	RBS2102	Lw (c)		14.5	70.9	71.2	74.6	61.6	51.8	48.6	47.2	47.9	67.3	77.5	CT Meas
RBS 2106	RBS2106	Lw (c)		14.5	78.9	75.7	69.8	61.5	60.4	56.7	58.5	49.1	67.6	81.1	CT Meas
Playground Noise	jrm	Lw (c)		88.9	92.8	88.2	78.6	79.3	86.9	88.5	82.5	70.2	92.4	96.9	Jess Ras Meas 1
Modcel 4.0 and Battery Cabinet	mod4	Lw (c)		10.3	79.2	77.3	81.6	78.9	72.1	67	59.1	54.8	79.1	85.8	Measured from CT

Carrier 38HDL-60	hdl38	Lw	A	0	0	60.9	55.9	60.3	61.5	59.2	57	47.9	67.4	77.6	Website
Carrier 38TUC-060	tua	Lw	A	0	0	59.5	73	70	68	66.5	65.5	60	76.6	83.3	Carrier Website
Carrier 38TUA-36	tua	Lw		0	0	58	64	67.5	67	66	64.5	59	72.4	73.3	carrier.com
Verizon Generator Vent	vervent	Lw		0	0	83	81	81	73	66	63	0	80.4	86.8	TAP
ATT Cabinets	A	Li		80.4	83.9	85.7	76.9	75.4	82.2	81.1	76.9	76	86.6	90.8	
Cricket CMO Cabinet	L1	Lw (c)		14.6	75.9	68.8	69.6	73.7	71.4	69.2	63.1	52.8	76.1	80.2	
Ericsson RBS 2106 Cabinet	L2	Lw (c)		14.6	79	75.8	69.9	61.6	60.5	56.8	58.6	49.2	67.7	81.2	
Sprint Equipment at Vent	L3	Lw		0	59.4	60.4	69.6	68.5	61.1	57.9	50.5	43.3	68.4	73.1	
Nextel Carrier HVAC Units	L4	Lw		0	79.7	86	82	81.6	81.5	79.8	74.8	69.1	86.2	90.3	
Ericsson RBS 2102 Cabinet	L5	Lw (c)		14.6	71	71.3	74.7	61.7	51.9	48.7	47.3	48	67.4	77.6	
Cricket PPC Cabinet	ppc	Lw (c)		62.1	67.4	64.6	67.2	67.2	56.5	45.9	34.6	20.2	65.8	73.2	irb Meas
HVAC unit Bonita Highland	Bayrd	Lw (c)		16.6	16.6	16.6	16.6	91	16.6	16.6	16.6	16.6	87.8	91	IRB Meas
Bard HVAC Unit	bard	Lw (c)		14.6	14.6	14.6	14.6	84.6	14.6	14.6	14.6	14.6	81.4	84.6	Misc Noise Info Manufacturer's
Four Verizon Cabinets - Back	VZWb	Lw (c)		20.7	77.8	73	83.3	75	73.8	70.4	63.5	59.6	79.4	85.6	CT Meas
Four Verizon Cabinets - Front	vzwf	Lw (c)		20.7	75	77.5	80.1	73.9	71.9	71.8	66.4	61	78.4	84	CT Meas
Sprint Flex Cabinet	sprt	Lw (c)		10.2	79.1	77.2	81.5	78.8	72	66.9	59	54.7	79	85.7	CT misc noise meas
Generac Generator	gen	Lw (c)	A	47.6	84.5	85.6	90.9	91.7	88.2	89.1	85.2	77.5	97.2	111.6	
McLean AWP T29 HVAC Unit	awp	Lw (c)		14.6	14.6	14.6	14.6	83.6	14.6	14.6	14.6	14.6	80.4	83.6	McLean
Sun HVAC Unit	sun1	Lw (c)		72	84.6	88.3	88	85.5	78.7	75.6	70.8	63.3	86.1	93.2	IRB meas A60317
Genrac Power Systems	gen30	Lw (c)		27.9	101.7	86.8	89.6	90.8	90.3	85.1	81	77.9	93.9	102.8	

Cadna/A-Berechnung
Version 3.5.115 (32 Bit)
Datei: \\Whitney\active files\Jobs 2006\A60331 Nextel.Sprint-CA8997Jojoba-San Diego-MB&CRL\A60331N1 Noise Study\Cadna Folder\A60331N1 Mit ver 1 irb.cna
Start: 14.08.06 14:36:54
Berechnungsparameter:

General	
Country	International
Max. Error	0
Max. Searc	2000
Min. Dist S	0
Partition	
Raster Fac	0.5
Max. Lengt	1000
Min. Lengtl	1
Min. Lengtl	0
Proj. Line S	On
Proj. Area S	On
Ref. Time	
Reference	960
Reference	480
Daytime Pe	0
Recr. Time	0
Night-time	0
DTM	
Standard H	0
Model of Te	Triangulation
Reflection	
max. Order	0
Search Rad	100.00 100.00
Max. Distar	1000.00 1000.00
Min. Distan	1.00 1.00
Min. Distan	0.1
Industrial (ISO 9613)	
Lateral Diff	some Obj
Obst. within	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit
Barrier Coe	3.0 20.0 0.0
Temperatu	20
rel. Humidit	20
Ground Ab	1
Wind Spee	3
Roads (RLS-90)	
Strictly acc. to RLS-90	
Railways (Schall 03)	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (AzB)	
Strictly acc. to AzB	

Receiver: North
ID:
X: 105.25
Y: 369.53

Z: 1.5
Ground: 0

ISO	Bezeichnur	ID	X	Y	Z	Ground	ReflOrd	LxT	LxN	L/A	Dist.	hm	Freq	Adiv	K0b	Agr	Abar
	T-Mobile G		107.12	362.53	1.5	0	0	85.4	85.4	1	7.24	1.5	500	28.2	0	1.34	0
	Nextel HV/		108.58	345.74	1	0	0	-24.9	-24.9	1	24.02	1.96	32	38.61	0	-3	5.15
	Nextel HV/		108.58	345.74	1	0	0	68.2	68.2	1	24.02	1.96	63	38.61	0	-3	6.81
	Nextel HV/		108.58	345.74	1	0	0	75.9	75.9	1	24.02	1.96	125	38.61	0	0.45	7.09
	Nextel HV/		108.58	345.74	1	0	0	83.4	83.4	1	24.02	1.96	250	38.61	0	5.68	5.5
	Nextel HV/		108.58	345.74	1	0	0	81.8	81.8	1	24.02	1.96	500	38.61	0	5.27	8.45
	Nextel HV/		108.58	345.74	1	0	0	85.1	85.1	1	24.02	1.96	1000	38.61	0	1.03	14.52
	Nextel HV/		108.58	345.74	1	0	0	82.5	82.5	1	24.02	1.96	2000	38.61	0	0	18.05
	Nextel HV/		108.58	345.74	1	0	0	75.1	75.1	1	24.02	1.96	4000	38.61	0	0	18.91
	Nextel HV/		108.58	345.74	1	0	0	68.6	68.6	1	24.02	1.96	8000	38.61	0	0	19.42
	T-Mobile H		100	355.41	0.5	0	0	-24.8	-24.8	1	15.09	1	32	34.58	0	-3	0
	T-Mobile H		100	355.41	0.5	0	0	61.5	61.5	1	15.09	1	63	34.58	0	-3	0
	T-Mobile H		100	355.41	0.5	0	0	75.4	75.4	1	15.09	1	125	34.58	0	0.25	0
	T-Mobile H		100	355.41	0.5	0	0	73.8	73.8	1	15.09	1	250	34.58	0	4.01	0
	T-Mobile H		100	355.41	0.5	0	0	79.9	79.9	1	15.09	1	500	34.58	0	4.54	0
	T-Mobile H		100	355.41	0.5	0	0	79.5	79.5	1	15.09	1	1000	34.58	0	1.21	0
	T-Mobile H		100	355.41	0.5	0	0	76.5	76.5	1	15.09	1	2000	34.58	0	0	0
	T-Mobile H		100	355.41	0.5	0	0	71.9	71.9	1	15.09	1	4000	34.58	0	0	0
	T-Mobile H		100	355.41	0.5	0	0	62.8	62.8	1	15.09	1	8000	34.58	0	0	0
Limit. Valu		0	0														
Level D/N:		56.6368	56.6368														

Receiver: South
ID:
X: 108.48
Y: 171.63
Z: 1.5
Ground: 0

ISO	Bezeichnur	ID	X	Y	Z	Ground	ReflOrd	LxT	LxN	L/A	Dist.	hm	Freq	Adiv	K0b	Agr	Abar
	Nextel HV/		108.58	345.74	1	0	0	-24.9	-24.9	1	174.11	2.46	32	55.82	0	-4.71	4.12
	Nextel HV/		108.58	345.74	1	0	0	68.2	68.2	1	174.11	2.46	63	55.82	0	-4.71	5.24
	Nextel HV/		108.58	345.74	1	0	0	75.9	75.9	1	174.11	2.46	125	55.82	0	1.9	5.42
	Nextel HV/		108.58	345.74	1	0	0	83.4	83.4	1	174.11	2.46	250	55.82	0	14.43	0.56
	Nextel HV/		108.58	345.74	1	0	0	81.8	81.8	1	174.11	2.46	500	55.82	0	13.39	5.3
	Nextel HV/		108.58	345.74	1	0	0	85.1	85.1	1	174.11	2.46	1000	55.82	0	2.61	12.99
	Nextel HV/		108.58	345.74	1	0	0	82.5	82.5	1	174.11	2.46	2000	55.82	0	0	15.85
	Nextel HV/		108.58	345.74	1	0	0	75.1	75.1	1	174.11	2.46	4000	55.82	0	0	18.25
	Nextel HV/		108.58	345.74	1	0	0	68.6	68.6	1	174.11	2.46	8000	55.82	0	0	20.38
	T-Mobile G		107.12	362.53	1.5	0	0	85.4	85.4	1	190.9	2.45	500	56.62	0	9.73	0
	T-Mobile H		100	355.41	0.5	0	0	-24.8	-24.8	1	183.98	1	32	56.3	0	-5.02	0
	T-Mobile H		100	355.41	0.5	0	0	61.5	61.5	1	183.98	1	63	56.3	0	-5.02	0
	T-Mobile H		100	355.41	0.5	0	0	75.4	75.4	1	183.98	1	125	56.3	0	1.85	0
	T-Mobile H		100	355.41	0.5	0	0	73.8	73.8	1	183.98	1	250	56.3	0	15.04	0
	T-Mobile H		100	355.41	0.5	0	0	79.9	79.9	1	183.98	1	500	56.3	0	17.01	0
	T-Mobile H		100	355.41	0.5	0	0	79.5	79.5	1	183.98	1	1000	56.3	0	4.54	0
	T-Mobile H		100	355.41	0.5	0	0	76.5	76.5	1	183.98	1	2000	56.3	0	0	0
	T-Mobile H		100	355.41	0.5	0	0	71.9	71.9	1	183.98	1	4000	56.3	0	0	0
	T-Mobile H		100	355.41	0.5	0	0	62.8	62.8	1	183.98	1	8000	56.3	0	0	0

Limit. Value	0	0
Level D/N:	25.0765	25.0765

Receiver: East
ID:
X: 296.02
Y: 372.18
Z: 1.5
Ground: 0

ISO	Bezeichnur	ID	X	Y	Z	Ground	ReflOrd	LxT	LxN	L/A	Dist.	hm	Freq	Adiv	K0b	Agr	Abar	
	Nextel HV/		108.58	345.74	1	0	0	-24.9	-24.9	1	189.3	1.25	32	56.54	0	-4.81	0	
	Nextel HV/		108.58	345.74	1	0	0	68.2	68.2	1	189.3	1.25	63	56.54	0	-4.81	0	
	Nextel HV/		108.58	345.74	1	0	0	75.9	75.9	1	189.3	1.25	125	56.54	0	2.05	0	
	Nextel HV/		108.58	345.74	1	0	0	83.4	83.4	1	189.3	1.25	250	56.54	0	14.55	0	
	Nextel HV/		108.58	345.74	1	0	0	81.8	81.8	1	189.3	1.25	500	56.54	0	13.5	0	
	Nextel HV/		108.58	345.74	1	0	0	85.1	85.1	1	189.3	1.25	1000	56.54	0	2.63	0	
	Nextel HV/		108.58	345.74	1	0	0	82.5	82.5	1	189.3	1.25	2000	56.54	0	0	0	
	Nextel HV/		108.58	345.74	1	0	0	75.1	75.1	1	189.3	1.25	4000	56.54	0	0	0	
	Nextel HV/		108.58	345.74	1	0	0	68.6	68.6	1	189.3	1.25	8000	56.54	0	0	0	
	T-Mobile G		107.12	362.53	1.5	0	0	85.4	85.4	1	189.15	1.5	500	56.54	0	9.72	0	
	T-Mobile H		100	355.41	0.5	0	0	-24.8	-24.8	1	196.74	2.44	32	56.88	0	-5.09	3.57	
	T-Mobile H		100	355.41	0.5	0	0	61.5	61.5	1	196.74	2.44	63	56.88	0	-5.09	4.96	
	T-Mobile H		100	355.41	0.5	0	0	75.4	75.4	1	196.74	2.44	125	56.88	0	1.99	5.68	
	T-Mobile H		100	355.41	0.5	0	0	73.8	73.8	1	196.74	2.44	250	56.88	0	15.13	0.77	
	T-Mobile H		100	355.41	0.5	0	0	79.9	79.9	1	196.74	2.44	500	56.88	0	17.11	3.03	
	T-Mobile H		100	355.41	0.5	0	0	79.5	79.5	1	196.74	2.44	1000	56.88	0	4.56	13.5	
	T-Mobile H		100	355.41	0.5	0	0	76.5	76.5	1	196.74	2.44	2000	56.88	0	0	16.65	
	T-Mobile H		100	355.41	0.5	0	0	71.9	71.9	1	196.74	2.44	4000	56.88	0	0	19.01	
	T-Mobile H		100	355.41	0.5	0	0	62.8	62.8	1	196.74	2.44	8000	56.88	0	0	21.02	

Limit. Value	0	0
Level D/N:	28.2899	28.2899

Receiver: West - North
ID:
X: 92.04
Y: 362.71
Z: 1.5
Ground: 0

ISO	Bezeichnur	ID	X	Y	Z	Ground	ReflOrd	LxT	LxN	L/A	Dist.	hm	Freq	Adiv	K0b	Agr	Abar	
	T-Mobile H		100	355.41	0.5	0	0	-24.8	-24.8	1	10.85	1	32	31.71	0	-3	0	
	T-Mobile H		100	355.41	0.5	0	0	61.5	61.5	1	10.85	1	63	31.71	0	-3	0	
	T-Mobile H		100	355.41	0.5	0	0	75.4	75.4	1	10.85	1	125	31.71	0	0.19	0	
	T-Mobile H		100	355.41	0.5	0	0	73.8	73.8	1	10.85	1	250	31.71	0	3	0	
	T-Mobile H		100	355.41	0.5	0	0	79.9	79.9	1	10.85	1	500	31.71	0	3.39	0	
	T-Mobile H		100	355.41	0.5	0	0	79.5	79.5	1	10.85	1	1000	31.71	0	0.9	0	
	T-Mobile H		100	355.41	0.5	0	0	76.5	76.5	1	10.85	1	2000	31.71	0	0	0	
	T-Mobile H		100	355.41	0.5	0	0	71.9	71.9	1	10.85	1	4000	31.71	0	0	0	
	T-Mobile H		100	355.41	0.5	0	0	62.8	62.8	1	10.85	1	8000	31.71	0	0	0	
	Nextel HV/		108.58	345.74	1	0	0	-24.9	-24.9	1	23.7	2.62	32	38.49	0	-3	6.21	
	Nextel HV/		108.58	345.74	1	0	0	68.2	68.2	1	23.7	2.62	63	38.49	0	-3	8.2	
	Nextel HV/		108.58	345.74	1	0	0	75.9	75.9	1	23.7	2.62	125	38.49	0	0.44	8.67	

	Nextel HVA		108.58	345.74	1	0	0	83.4	83.4	1	23.7	2.62	250	38.49	0	5.62	8.13
	Nextel HVA		108.58	345.74	1	0	0	81.8	81.8	1	23.7	2.62	500	38.49	0	5.21	12.25
	Nextel HVA		108.58	345.74	1	0	0	85.1	85.1	1	23.7	2.62	1000	38.49	0	1.02	18.57
	Nextel HVA		108.58	345.74	1	0	0	82.5	82.5	1	23.7	2.62	2000	38.49	0	0	22.21
	Nextel HVA		108.58	345.74	1	0	0	75.1	75.1	1	23.7	2.62	4000	38.49	0	0	23.42
	Nextel HVA		108.58	345.74	1	0	0	68.6	68.6	1	23.7	2.62	8000	38.49	0	0	24.14
	T-Mobile G		107.12	362.53	1.5	0	0	85.4	85.4	1	15.08	1.5	500	34.57	0	2.59	0
Limit. Value		0	0														
Level D/N:		53.4069	53.4069														

Receiver: West - South
ID:
X: 89.76
Y: 346.13
Z: 1.5
Ground: 0

ISO	Bezeichnur	ID	X	Y	Z	Ground	ReflOrd	LxT	LxN	L/A	Dist.	hm	Freq	Adiv	K0b	Agr	Abar
	Nextel HVA		108.58	345.74	1	0	0	-24.9	-24.9	1	18.83	1.93	32	36.5	0	-3	5.51
	Nextel HVA		108.58	345.74	1	0	0	68.2	68.2	1	18.83	1.93	63	36.5	0	-3	7.04
	Nextel HVA		108.58	345.74	1	0	0	75.9	75.9	1	18.83	1.93	125	36.5	0	0.36	6.29
	Nextel HVA		108.58	345.74	1	0	0	83.4	83.4	1	18.83	1.93	250	36.5	0	4.67	4.31
	Nextel HVA		108.58	345.74	1	0	0	81.8	81.8	1	18.83	1.93	500	36.5	0	4.33	6.83
	Nextel HVA		108.58	345.74	1	0	0	85.1	85.1	1	18.83	1.93	1000	36.5	0	0.84	12.58
	Nextel HVA		108.58	345.74	1	0	0	82.5	82.5	1	18.83	1.93	2000	36.5	0	0	16.1
	Nextel HVA		108.58	345.74	1	0	0	75.1	75.1	1	18.83	1.93	4000	36.5	0	0	18.98
	Nextel HVA		108.58	345.74	1	0	0	68.6	68.6	1	18.83	1.93	8000	36.5	0	0	19.68
	T-Mobile H		100	355.41	0.5	0	0	-24.8	-24.8	1	13.86	1	32	33.83	0	-3	0
	T-Mobile H		100	355.41	0.5	0	0	61.5	61.5	1	13.86	1	63	33.83	0	-3	0
	T-Mobile H		100	355.41	0.5	0	0	75.4	75.4	1	13.86	1	125	33.83	0	0.24	0
	T-Mobile H		100	355.41	0.5	0	0	73.8	73.8	1	13.86	1	250	33.83	0	3.73	0
	T-Mobile H		100	355.41	0.5	0	0	79.9	79.9	1	13.86	1	500	33.83	0	4.21	0
	T-Mobile H		100	355.41	0.5	0	0	79.5	79.5	1	13.86	1	1000	33.83	0	1.12	0
	T-Mobile H		100	355.41	0.5	0	0	76.5	76.5	1	13.86	1	2000	33.83	0	0	0
	T-Mobile H		100	355.41	0.5	0	0	71.9	71.9	1	13.86	1	4000	33.83	0	0	0
	T-Mobile H		100	355.41	0.5	0	0	62.8	62.8	1	13.86	1	8000	33.83	0	0	0
	T-Mobile G		107.12	362.53	1.5	0	0	85.4	85.4	1	23.88	2.44	500	38.56	0	3.78	2.63
Limit. Value		0	0														
Level D/N:		50.4771	50.4771														

Berechnun 14.08.06 14:36:54 (0 s)

z	Aatm	Afol	Ahous	Cmet	CmetN	Dc	RL	LtotT	LtotN
0	0.02	0	0	0	0	0	0	55.85	55.85
0.85	0	0	0	0	0	0	0	-65.65	-65.65
0.85	0.01	0	0	0	0	0	0	25.78	25.78
0.85	0.02	0	0	0	0	0	0	29.75	29.75
0.85	0.03	0	0	0	0	0	0	33.59	33.59
0.85	0.06	0	0	0	0	0	0	29.42	29.42
0.85	0.16	0	0	0	0	0	0	30.8	30.8
0.85	0.52	0	0	0	0	0	0	25.34	25.34
0.85	1.78	0	0	0	0	0	0	15.82	15.82
0.85	5.17	0	0	0	0	0	0	5.42	5.42
0	0	0	0	0	0	0	0	-56.35	-56.35
0	0	0	0	0	0	0	0	29.95	29.95
0	0.01	0	0	0	0	0	0	40.59	40.59
0	0.02	0	0	0	0	0	0	35.22	35.22
0	0.04	0	0	0	0	0	0	40.78	40.78
0	0.1	0	0	0	0	0	0	43.64	43.64
0	0.32	0	0	0	0	0	0	41.63	41.63
0	1.12	0	0	0	0	0	0	36.23	36.23
0	3.25	0	0	0	0	0	0	25.01	25.01

z	Aatm	Afol	Ahous	Cmet	CmetN	Dc	RL	LtotT	LtotN
1.74	0.01	0	0	0	0	0	0	-80.13	-80.13
1.74	0.05	0	0	0	0	0	0	11.82	11.82
1.74	0.12	0	0	0	0	0	0	12.66	12.66
1.74	0.24	0	0	0	0	0	0	12.37	12.37
1.74	0.45	0	0	0	0	0	0	6.86	6.86
1.74	1.14	0	0	0	0	0	0	12.56	12.56
1.74	3.74	0	0	0	0	0	0	7.11	7.11
1.74	12.9	0	0	0	0	0	0	-11.86	-11.86
1.74	37.46	0	0	0	0	0	0	-45.04	-45.04
0.11	0.5	0	0	0	0	0	0	18.57	18.57
0	0.01	0	0	0	0	0	0	-76.06	-76.06
0	0.05	0	0	0	0	0	0	10.21	10.21
0	0.13	0	0	0	0	0	0	17.15	17.15
0	0.26	0	0	0	0	0	0	2.28	2.28
0	0.48	0	0	0	0	0	0	8.16	8.16
0	1.2	0	0	0	0	0	0	17.5	17.5
0	3.95	0	0	0	0	0	0	16.29	16.29
0	13.63	0	0	0	0	0	0	2	2
0	39.58	0	0	0	0	0	0	-33.05	-33.05

z	Aatm	Afol	Ahous	Cmet	CmetN	Dc	RL	LtotT	LtotN
0	0.01	0	0	0	0	0	0	-76.63	-76.63
0	0.05	0	0	0	0	0	0	16.43	16.43
0	0.13	0	0	0	0	0	0	17.19	17.19
0	0.26	0	0	0	0	0	0	12.06	12.06
0	0.49	0	0	0	0	0	0	11.28	11.28
0	1.24	0	0	0	0	0	0	24.7	24.7
0	4.06	0	0	0	0	0	0	21.91	21.91
0	14.03	0	0	0	0	0	0	4.54	4.54
0	40.73	0	0	0	0	0	0	-28.65	-28.65
0	0.49	0	0	0	0	0	0	18.67	18.67
2.52	0.01	0	0	0	0	0	0	-80.15	-80.15
2.52	0.05	0	0	0	0	0	0	4.72	4.72
2.52	0.14	0	0	0	0	0	0	10.74	10.74
2.52	0.27	0	0	0	0	0	0	0.9	0.9
2.52	0.51	0	0	0	0	0	0	4.52	4.52
2.52	1.29	0	0	0	0	0	0	3.31	3.31
2.52	4.22	0	0	0	0	0	0	-1.22	-1.22
2.52	14.58	0	0	0	0	0	0	-18.54	-18.54
2.52	42.33	0	0	0	0	0	0	-57.4	-57.4

z	Aatm	Afol	Ahous	Cmet	CmetN	Dc	RL	LtotT	LtotN
0	0	0	0	0	0	0	0	-53.48	-53.48
0	0	0	0	0	0	0	0	32.82	32.82
0	0.01	0	0	0	0	0	0	43.53	43.53
0	0.02	0	0	0	0	0	0	39.11	39.11
0	0.03	0	0	0	0	0	0	44.8	44.8
0	0.07	0	0	0	0	0	0	46.85	46.85
0	0.23	0	0	0	0	0	0	44.59	44.59
0	0.8	0	0	0	0	0	0	39.42	39.42
0	2.33	0	0	0	0	0	0	28.79	28.79
0.88	0	0	0	0	0	0	0	-66.6	-66.6
0.88	0.01	0	0	0	0	0	0	24.52	24.52
0.88	0.02	0	0	0	0	0	0	28.3	28.3

0.88	0.03	0	0	0	0	0	0	31.14	31.14
0.88	0.06	0	0	0	0	0	0	25.79	25.79
0.88	0.15	0	0	0	0	0	0	26.88	26.88
0.88	0.51	0	0	0	0	0	0	21.3	21.3
0.88	1.76	0	0	0	0	0	0	11.44	11.44
0.88	5.1	0	0	0	0	0	0	0.88	0.88
0	0.04	0	0	0	0	0	0	48.22	48.22

z	Aatm	Afol	Ahous	Cmet	CmetN	Dc	RL	LtotT	LtotN
0.38	0	0	0	0	0	0	0	-63.89	-63.89
0.38	0	0	0	0	0	0	0	27.67	27.67
0.38	0.01	0	0	0	0	0	0	32.76	32.76
0.38	0.03	0	0	0	0	0	0	37.92	37.92
0.38	0.05	0	0	0	0	0	0	34.11	34.11
0.38	0.12	0	0	0	0	0	0	35.07	35.07
0.38	0.4	0	0	0	0	0	0	29.52	29.52
0.38	1.4	0	0	0	0	0	0	18.24	18.24
0.38	4.05	0	0	0	0	0	0	8.39	8.39
0	0	0	0	0	0	0	0	-55.6	-55.6
0	0	0	0	0	0	0	0	30.69	30.69
0	0.01	0	0	0	0	0	0	41.35	41.35
0	0.02	0	0	0	0	0	0	36.25	36.25
0	0.04	0	0	0	0	0	0	41.85	41.85
0	0.09	0	0	0	0	0	0	44.48	44.48
0	0.3	0	0	0	0	0	0	42.4	42.4
0	1.03	0	0	0	0	0	0	37.07	37.07
0	2.98	0	0	0	0	0	0	26.02	26.02
0.31	0.06	0	0	0	0	0	0	40.38	40.38